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## THE CESAREAN PROBLEM\*

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DURING the past twenty-five years obstetrics has made great advances in procedures potential for the reduction of maternal mortality. The perfection of roentgen-ray technic has made possible the more accurate diagnosis of any abnormality of the bony pelvis. The development of high carbohydrate therapy and hydration by intravenous glucose administration, together with our knowledge of vitamin B deficiency, has increased our chances of curing pernicious vomiting and have reduced the frequency of the dangerous necessity of therapeutic abortion. The perfection and more widespread realization of the value of prenatal care have increased the likelihood of bringing women to labor in better general physical condition and with the birth canal uninfected. Again, prenatal care has made for the earlier detection of the approach of preëclampsic toxemia and improved treatment has made the accession of eclampsia less frequent; and, in addition, conservative treatment of eclampsia has proven its superiority over accouchement forcé and major operative interference. We have learned about droplet infection and the importance of excluding those with colds, throat and sinus infection, from attendance on women in labor and the importance of masking all attending nurses and physicians throughout labor. The perfection of blood transfusion technic and the more widespread realization of its value have increased our command over the results of hemorrhage, shock and infection. Further experience with the low cervical cesarean section has incontestably proven its marked superiority over classical section in point of lower maternal morbidity and mortality, and

the substitution of local novocaine anesthesia in place of inhalation anesthesia, where possible, has added to the safety of the operation.

In spite of all of these advances, it is a striking fact that the general maternal mortality rate has been reduced very little. This fact is rendered more striking when we consider that, in addition to these advances, we have seen a narrowing of those areas previously inaccessible to medical attention. We have seen tremendous educational campaigns that must have reduced the factors of public ignorance and apathy to a certain extent. We have witnessed the wide extension of social service and public health nursing, and the extension of special facilities for maternal care, including personnel and materiel, in nearly every town of any appreciable size. And year by year, though obstetrical education has always had its faults and limitations, at least facilities for teaching have continuously improved.

The great discrepancy between what one would reasonably expect in the lowering of general maternal mortality and the facts as proved by statistics has led to continuous investigations and controversies. A study of these investigations insistently suggests: that, with the more widespread dissemination and absorption of at least a rudimentary surgical knowledge, and emboldened by a false feeling of security engendered by the remarkable achievements of some of our masters in the obstetric art, and with the extension of hospital facilities of standardized perfection, an increasing number of inadequately trained men are availing themselves of the facilities of the art of obstetrics without waiting to learn the principles of the art; and that an increasing spirit of radicalism, that has

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not confined itself to the untrained and the inexperienced, has activated many men to operate without proper regard for well-recognized indications and often in defiance of contraindications, with results that have clearly placed the errors and abuses of operative obstetrics in the forefront of those causes that have retarded the reduction of general maternal mortality. A more specific and comprehensive analysis of the factors causing increased operative rate is that of Dr. E. D. Plass:<sup>52</sup>

1. Sense of security engendered by the use of modern antiseptics and asepsis.
2. Employment of anesthetics.
3. An exaggerated idea of the value of the infant's life as compared with the life and health of the mother.
4. Demand for shorter and more comfortable labors.
5. Convenience of patient, husband, doctor or other person.
6. Education of the laity to a higher scale of fees for operative procedures, although often the value of services in non-operative deliveries is much greater.

Among obstetrical operations, cesarean section has become so prominent as a factor in preventable maternal mortality that it has become a veritable problem and I have chosen this problem for discussion because I am convinced that there is every indication that it will continue to be an increasing factor in preventable maternal mortality unless each and every member of the profession, no matter what his individual specialty may be, understands the problem thoroughly and lends his aid to its solution in the general staff meetings of the hospitals to which he belongs. It is the one obstetrical problem that lends itself entirely to hospital staff influence. All other obstetrical errors and abuses causing preventable maternal mortality may be consummated outside of a hospital and beyond staff influence, but not cesarean section.

The modern trend toward the wide extension of indications for, and incidence of, cesarean section, and its manifest alarming results, has given those interested in maternal mortality ample cause for alarm and criticism. Warning literature and medical education, however, have had little apparent influence in checking the rapid increase in incidence and the increase in mortality toll. Those of you who have not practiced obstetrics for many years or have never practiced obstetrics, have, I believe, little realization of the conditions surrounding the private practice of obstetrics today in regard to cesarean section.

Twenty-five years ago it was difficult to persuade the average patient and her family to permit a very necessary cesarean operation. Today, at every delay in labor, the family and friends ask why this operation is not being done. And, if the child succumbs under delivery by the natural channels, the implication is that somewhere mismanagement has obtained. Had Doctor So-and-So had the case, he would have done a cesarean. Even the general medical profession has a tendency to assume this attitude, due largely to the increasing number of cesarean sections performed, coupled with the ever-increasing number of reports of large series without a death. Few men publish their poor results and disasters. These are picked up only in surveys and other painstaking studies that are too expensive in time and money to be very frequent. The general profession does not have time to study the whole picture. The young obstetrician with conservative tendencies is today on the spot, so to speak. If he treats a case conscientiously and conservatively and loses the baby, the death is discussed in the monthly hospital staff meeting. If his confrere performs a cesarean section at the first appearance of delay, yet for no justifiable indication, and baby and mother live, nothing is said except in praise of his acumen.

If we are to stop this dangerous increase in cesarean sections, the general profession must give obstetricians the same backing for the performance of good safe obstetrics that we all had twenty-five years ago.

Throughout the literature it is obvious that the aim of our pioneers has been to so reduce the operative mortality of cesarean section that it can be substituted, without increased risk for the mother, for measures that result in higher infant morbidity and mortality. Progress in this direction accounts by natural law for some of the increase in incidence. But many physicians and the public have greatly over-estimated this progress. It is true that the progress in this direction which has been made by men whose obstetrical judgment has kept pace with their improvement of technic has been remarkable. Unfortunately, the published results of such men have misled practicing obstetricians, the general profession and the public. Few men can be well-rounded virtuosi no matter how fine their training and no matter how assiduously they practice.

# CESAREAN PROBLEM—LA VAKE

TABLE I

Deliveries—49,397		Contracted Pelves—5,288		
			Maternal Mortality	Mortality of Child
Spontaneous births	4116	77.8%	.09%	2.2%
Forceps with head in pelvis	207	3.9%	0.0%	11.6%
Turning in transverse presentation	353	6.6%	.5%	28.6%
Extraction in breech	30	.5%	3.3%	40. %
Craniotomy in dead child	82	1.5%	6.0%	100. %
Decapitation	9	.16%	33.3%	100. %
Artificial premature labor	34	.6%	2.9%	47. %
Prophylactic turning	94	1.7%	1.05%	21. %
Forceps above brim	147	2.7%	1.3%	38.7%
Craniotomy on living child	76	1.4%	1.3%	100. %
Cesarean section	116	2.1%	3.4%	1.7%
Widening of pelvis	23	2. %	0.0%	4.3%
Total	5,288	10.7%	.45%	2.28%

The most reliable statistics today show that the average operative mortality of cesarean section is at least four times higher than that of our virtuosi. As this average includes the results of our virtuosi, one can estimate what the accomplishment of others must be. Dr. Frank Lynch,<sup>30</sup> in the largest compilation of cesarean sections performed since 1930, 12,955 sections, gives the incidence as 2.5 per cent and the operative mortality 4.1 per cent. Dr. Joseph B. DeLee<sup>16</sup> reports 1,875 low cervical operations from the Chicago Lying-In Hospital, with an operative mortality of .96 per cent. Dr. Frederick C. Irving<sup>22</sup> reports the operative mortality of 2,467 low cervical operations as reported by fifteen authors in the past six years, as 1.6 per cent.

Now let us compare these figures with those from Dr. Shauta's<sup>27</sup> clinic given in 1909, relative to the treatment of contracted pelvis. (Table I)

It is striking that, even for the fundamental indication of contracted pelvis, the incidence of cesarean section in 49,397 deliveries was only .23 per cent and the cesarean mortality was 3.4 per cent. Would any one suggest that Shauta and his coworkers were not just as anxious as our best obstetricians of today to substitute section for the types of handling that gave a higher infant mortality? He was specific in suggesting

the future possibility of such substitution, but specified that such substitution were unwise unless the patients presented with no form of previous vaginal interference. Shauta was one of the first men to present a large series of cesarean sections without a death, and we can be certain that it was not poor judgment or lack of operative ability that limited the incidence in this exhibit. Were Dr. Shauta with us today, his incidence would no doubt be as proportionately higher as his operative mortality could be lowered.

The following are Shauta's opinions:

"Spontaneous birth affords by far the best solution of the many complicated problems of contracted pelvis. The objection might naturally be made that spontaneous birth is not always possible. This is unfortunately quite correct. But spontaneous birth is more frequently possible than it appears from our statistics. By premature interference with its natural course, many cases of labor are directed into a wrong course and result in great injury to both mother and child. There is no doubt that if these principles, admitted in the present day, were universally and steadily observed, the number of spontaneous births in contracted pelvis would steadily increase. At my clinic about 80 per cent of the births with narrow pelvis actually occur spontaneously, only full-term births being taken into account. The application of forceps above the brim and prophylactic turning should, if possible, be entirely removed from the list of methods of treatment of contracted pelvis. Before craniotomy on the living child is undertaken, prophylactic turning may be justified when cesarean section is out of the question. The two last mentioned operations (forceps above the brim and prophylactic turning) will find their indication in such types of cases as a last resort to save the life of the child before craniotomy is resorted to (forceps when the head is fixed, turning when it is movable). On the whole, our aim should be to leave labors in contracted pelvis as long as possible to the natural forces and failing then to perform only the operation which will most likely save both mother and child. All other operations should gradually be more and more limited. The patient must reach the expert in an absolutely aseptic condition without any obstetrical interference of any kind having been made. Until then, by a careful selection of cases, the percentage of danger should be reduced to a minimum."

I exhibit this chart and give Shauta's opinions because I believe they represent the acme of good judgment then and a model for emulation today. However, the young man of today following Shauta's philosophy must have the staunch backing of the general profession to survive. Every time he loses a baby he runs the chance of facing the tacit judgment of a large

part of the general profession and the more voracious judgment of the public that he should have known enough to have done a cesarean section in the first place. Of course, it is obvious that even with the greatest care, errors will be made, but Shauta's philosophy is more safe for the mother.

As a guide to the probabilities for spontaneous deliveries in various degrees of contracted pelvis, we have the figures of Dr. J. Whitridge Williams.<sup>68</sup>

TABLE II

True Conjugate	Spontaneous Ending
9. -10 cm.	77.28%
8.9- 8 cm.	61.54%
7.9- 7 cm.	33.33%
Under 6.9	0

"We believe that anything below 7 cm. should be an absolute indication for cesarean section with a live child. Relative indications, 7 or 7.5 to 8.5 for flat and 9 cm. for generally contracted pelves."

The question is often asked by physicians and laity alike: What is the comparison between the danger of normal delivery and cesarean section in the normal woman? Though, obviously, it is impossible to answer this question with accuracy because the answer depends on judgment, skill and chance, yet upon a studied and reasoned opinion as to the approximate answer to this fundamental question depends each man's measure of the philosophy, understanding and moral responsibility of any man who performs this operation without valid indications. It is not alone the question of the initial risk taken, but the assumption of responsibility for future risks. As C. Jeff Miller<sup>42</sup> expressed it:

"The performance of cesarean section by -- means terminates a surgeon's responsibilities. Once he has done it, he has charged to his account that woman's obstetric future, and he is responsible, at least morally, for what happens to her in her subsequent pregnancies. The scar is always a hazard as long as she is able to conceive, and since Gamble's disturbing investigation, we have no criterion by which to estimate its strength. The accident (rupture) is a possibility at any time after the sixth month and the intervention of one or several natural deliveries confers no form of immunity."

A study of reported figures is suggestive in providing an approximate answer to the above question.<sup>32</sup>

We may reasonably estimate 0.1 per cent, or one death in a thousand deliveries, as an irre-

ducible minimum in maternal mortality in normal delivery. Shauta<sup>57</sup> reported a maternal mortality of .09 per cent in 4,116 spontaneous deliveries and Duncan<sup>19</sup> a maternal mortality of .11 per cent in 2,766 spontaneous deliveries.

Holland<sup>29</sup> reported a corrected mortality of 1.5 per cent in a series of 1,189 cesarean sections, practically all the classical type and performed before the onset of labor. If it be true that, had they been handled by low cervical cesarean, a 50 per cent reduction in maternal mortality might reasonably have been expected, we would have an estimate that cesarean section is still approximately seven times as dangerous for the mother as spontaneous delivery, even in the hands of a skilled operator.

DeLee<sup>16</sup> reports 1,875 low cervical cesareans from the Chicago Lying-In Hospital, with a maternal mortality rate of .96 per cent. Though these figures are large enough to minimize the element of chance, they contain other than elective cases. I doubt if the average man could come near them even in elective cases under the best conditions.

T. L. Montgomery, in a discussion of a paper by Clifford B. Lull<sup>38</sup> in 1931, says that 9,823 cesarean sections from various metropolitan areas in the United States show that the operation is nearly seven times more dangerous than normal delivery.

When indications are valid and the cesarean operation is not an elective, it is impossible to arrive at any general approximate comparison. Each case must be decided by a comparison of probabilities determined by individual findings, indications and contraindications, and the relative statistical results between cesarean section and other obstetrical maneuvers. It is of value, however, to compare the general cesarean mortality rate in this connection with the general mortality rate from all forms of delivery, at present approximately 4.1 per cent to 0.6 per cent.

Frederick C. Irving,<sup>32</sup> in his analysis of a six-year period at the Boston Lying-In Hospital, in an attempt to compare cesarean section with those forms of operative delivery with which cesarean section usually competes—that is, high forceps, craniotomy, version, breech extraction, and mid forceps—says:

"Our mortality in cesarean section was about four times greater. On the other hand, cesarean section was



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TABLE III.

<i>Eclampsia</i>	<i>Cases</i>	<i>Conservative Mat. Mort.</i>	<i>Cesarean Mat. Mort.</i>	<i>Fetal Mort.</i>	<i>Infant Mort.</i>
Stroganoff <sup>62</sup>	839	8.9%		22%	
Cragin <sup>12</sup>	50	12.0%			
Lichtenstein <sup>10</sup>	94	5.3%		21.3%	37.3%
Peterson <sup>63,64</sup>	530 (Vag. Ces.)		23.4%		
	500 (Abd. Ces.)		34.8%		
Last	243 (Abd. Ces.)		25.79%	10.69%	
1st. 5 convul.	60 (Abd. Ces.)		15.0%	2.54%	
Lichtenstein <sup>17</sup>	200	8.5%		16.9%	39.44%
Stroganoff <sup>18</sup>	2208	9.8%			
Williams <sup>12</sup>	275	10.5%	25.0%		
		Mag. Sulph. intrav. 7.0%			
Lazard, Erwin, and Vruwink <sup>65</sup>			36.0%		
Holland <sup>19</sup>	195		31.8%	32.0%	50.0%
Welz <sup>27</sup>	26		42.7%	19.0%	
Miller <sup>13</sup>	41		41.5%	14.7%	
Thompson <sup>64</sup>	46		28.3%		

TABLE IV.

<i>Fromme</i>	<i>Active Treatment (Vag. Abd. Ces.)</i>		<i>Bloodletting, narcotics</i>	
	<i>Cases</i>	<i>M. M.</i>	<i>Cases</i>	<i>M. M.</i>
1- 5 convulsions	46	8.7%	60	1.7%
6-10 convulsions	10	20.0%	11	9.1%
10-40 convulsions	2	50.0%	8	37.5%
	58	12.1%	79	6.3%
<i>Freund</i>				
1 convulsion	68	7.4%	11	0.0%
2 convulsions	56	5.4%	15	6.7%
3- 5 convulsions	120	15.8%	34	0.0%
6-10 convulsions	75	22.7%	12	8.3%
11-20 convulsions	34	29.4%	4	0.0%
21-56 convulsions	32	28.1%	3	100.0%
? convulsions	14	28.6%	2	0.0%
Pp. Ekl. convulsions	146	15.1%	13	0.0%
	545	16.3%	94	5.3%

TABLE V.

	<i>Cases</i>	<i>M. M.</i>	<i>F. M.</i>
<i>Bill (1927)</i>			
Cesarean section—no transfusion	27	11.1%	37.3%
Cesarean section with transfusion	40	1.78%	32.1%
<i>Bill (1931)</i>			
Older methods	2117	9.68%	57.4%
Cesarean section with transfusion	262	1.78%	32.0%
<i>Siegel (1934)<sup>10</sup></i>			
Cesarean section with transfusion	101	.99%	24.75%

three times safer for the infant. In cases where there is a fair choice between pelvic delivery and cesarean section, one should consider well the increased risk to the mother, who is vastly more important than the infant, before one performs an operation which gives the baby an advantage, even though that advantage be three-fold."

## Eclampsia

Twenty-five years ago we had ample statistics that pointed to the superiority of the conservative treatment of eclampsia over the use of cesarean section, except where the indication of disproportion or obstruction existed, and these sta-

tistics have been further corroborated year by year and rendered thereby more conclusive; and yet, the use of cesarean section in this condition has shown no abatement. Furthermore, though Stander<sup>61</sup> showed that ether, chloroform, nitrous oxide and ethylene produce changes in the blood constituents very similar to those seen in eclampsia, inhalation anesthesia has been most generally used in cesarean section for eclampsia.

Lichtenstein compared the two forms of treatment according to the number of convulsions that had taken place (Table IV).

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TABLE VI.

	Cases	Cesarean M. M.	Obst. Treatment M. M.	Infant Mortality
Holmes <sup>21</sup>	2756		7.36%	54.1%
Complete	350		13.40%	80.0%
Incomplete	1022		4.30%	50.5%
Jewett <sup>22</sup>	2912		10.90%	57.3%
	95	11.50%		34.0%
Cragin <sup>23</sup>	49		8.10%	51.0%
Complete	14		14.20%	
Incomplete	35		5.70%	
Holland <sup>24</sup>	139	11.50%		27.3%
Hitschmann <sup>25</sup>	3035 (version)		6.30%	
	1095 (bag)		6.20%	85.0%
Momm	153	6.60%		14.0%
Findley <sup>26</sup>	27042		6.41%	57.43%
	4885	5.99%		24.45%
Gannsle <sup>27</sup>	93		8.60%	65.20%
	93	6.40%		6.40%
Bill <sup>5</sup>	2117		9.68%	57.40%
	262 (transf.)	1.78%		32.0%
Siegel <sup>18</sup>	101	.99%		24.15%
Aldridge and Parks' Woman's Hospital				
Marginal	61		1.6%	20.0%
	18	5.5%		5.6%
Partial	18		11.1%	35.3%
	28	3.6%		10.8%
Central	23		13. %	66.6%
	37	10.8%		21.7%
Sloane Hospital				
Marginal	113		1.8%	30.0%
	19	0.0%		0.0%
Partial	27		7.4%	55.6%
	5	0.0%		0.0%
Central	32		9.4%	84.7%
	19	10.5%		15.0%

## Cesarean Section and Placenta Previa

In the treatment of placenta previa, cesarean section has come into greater prominence and rightly so, since Dr. Bill,<sup>5</sup> of Cleveland, in 1927 reported the results of prophylactic blood transfusion and section.

Comparative statistics between cesarean and non-cesarean treatment in placenta previa are shown in Table VI.

To my mind, cesarean section should be used in every case where no vaginal interference of any kind has taken place, the child is alive and viable, and the previa is complete. Also, in the incomplete varieties, under the same conditions of asepsis and viability, where the cervix is so long and undilated that one experienced in the insertion of the Voorhees' bag can predict a very difficult insertion with likely an increase in separation, and a very long labor.

In 236 patients who bled to death, Hitschmann<sup>28</sup> brought out the facts that:

50% died because of the previa itself.

33% died from tears in the uterus, due to the abnormality of the placental site.

3.7% died from atony of the corpus.

2.9% died from atony of the lower segment.

2.3% died from adherent placenta.

It seems logical that cesarean section should prevent these tears. However, when the previa is so marginal or lateral, and the cervix dilated to the point where the Voorhees' bag can be used with ease, or one can count on the descending head stopping the bleeding by merely rupturing the membranes, I feel confident that these methods of treatment are more safe for the mother than cesarean section. After delivery from below, the uterus, cervix and vagina should be packed. Fluids, intravenous glucose and blood transfusion, as indicated, are here just as important for good results as in cesarean section. To my mind the safety of the mother should be our sole guide in the choice of treatment, because it has been my experience that placenta previa babies are markedly under par, apart from their degree of prematurity and the blood loss of the mother.

The findings of Findley,<sup>20</sup> in an analysis of

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TABLE VII.

	Cases	Maternal Mortality	Fetal Mortality
<i>Dorman</i> <sup>17</sup>			
Total	234 (Non-cesarean treatment)	5.1%	
Clinical	105	9.5%	
Totally concealed	15	20.0%	
<i>Holland</i> <sup>20</sup>	36 (Cesarean section)	11.0%	
	30 (Cesarean hysterectomy)	46.6%	
<i>Bland and Rakoff</i> <sup>7</sup>	414 (Expectant treatment)	4.1%	60.7%
	107 (Cesarean section)	11.2%	74.4%
	284 (Radical treatment)	13.4%	73.0%

47,828 collected cases of placenta previa, are important:

Incidence all types ..... .626%  
Incidence central ..... .186%

"Low cervical cesarean is the procedure of choice in complete placenta previa and in other types presenting a closed cervix."

These figures extending from 1905 constitute an interesting tabloid history of achievement. In 1905, Dr. Rudolph Holmes, after an extensive study of cesarean section and placenta previa, summed up the situation by stating that cesarean section lowered infant mortality 30 per cent but increased maternal mortality nearly three-fold. Today, under careful selection, improved operative technic, and the adjuvant use of blood transfusion and parenteral fluids, cesarean section would appear to be three times more safe for the mother than expectant obstetrical treatment and the same reduction in infant mortality obtains. This improvement could be more generally obtained if we could only learn to instruct women definitely to keep the vagina free from contamination from the sixth month on, and if we could only learn not to make vaginal examinations for purposes of diagnosis when bleeding obtains in the last three months of pregnancy. By the same token, if these two lessons were generally learned and strictly adhered to before and during every labor, it is my opinion that we would see a marked reduction in general maternal mortality. It has been my experience that the vaginal examination for purposes of diagnosis just before and during labor is necessary in only one in twenty cases. In the case where abdominal and rectal examination leave one in doubt, we should prepare for the vaginal examination as carefully as we would for a major obstetrical operation. The first consideration, if bleeding occurs in the last three months of pregnancy, should be immediate and continued

hospitalization and the typing and cross-matching of donors who should be quickly available if occasion demands.

## Cesarean Section and Premature Placental Separation

Premature separation of the normally situated placenta, as an indication for cesarean section, began to come into greater prominence after Couvelaire<sup>9</sup> in 1911 brought out the clinical entity designated by him as "apoplexie utero-placentaire." Dr. J. Whitridge Williams<sup>69</sup> made it more generally known to the profession in this country in 1915. Williams' attitude at that time holds, I believe, with equal force today, namely, that in the vast majority of cases, expectant treatment is the treatment of choice. In regard to cesarean section, he said:

"The latter operation should be chosen only when the cervix is but slightly dilated or when the general condition of the patient is more serious than can be accounted for by the amount of blood that has escaped. In this event, the condition is probably complicated by concealed uterine or intraperitoneal hemorrhage."

If the uterus will not contract after the cesarean operation, of course it must be taken out.

The statistics of Dorman<sup>17,18</sup> in 1913, Holland<sup>20</sup> in 1921, and Bland and Rakoff<sup>7</sup> in 1938, bear out Williams' contentions (Table VII).

The better recent cesarean mortality statistics in this condition are due primarily to the more general use of sufficient amounts of blood transfusion and parenteral fluids and, secondarily, to the increased use of the low cervical operation. Immediate hospitalization and the procurement of compatible blood donors should be our first consideration at the first suspicion of premature separation. In questionable decisions between expectant treatment and cesarean section, the effects of blood transfusion may make it quite apparent that expectant treatment should be

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chosen. This is most important because statistics show that, when indicated, expectant treatment with adequate blood transfusion and parenteral fluids is approximately three times more safe for the mother than cesarean section. Observations will show that much of our preventable cesarean mortality, in both placenta previa and premature separation, is due to operating when infection can be reasonably suspected and to operating before bringing the patient out of shock by adequate blood transfusion and other restorative measures, and then failing to continue adequate blood transfusion and parenteral fluids where indicated.

TABLE VIII.

	Cases	Maternal Mortality
<i>Reynolds (1907)<sup>59</sup></i>		
Before labor	82	1.2%
After a test of labor	158	4.0%
Late in labor	49	12.0%
<i>Routh (1911)<sup>64</sup></i>		
<i>Clean cases—</i>		
A. Not in labor	245	3.6%
B. In labor, membranes intact	224	2.2%
Total	469	2.9%
<i>Suspicious cases—</i>		
C. In labor, membranes rupt.	166	10.8%
D. Frequent exams. or attempts at delivery	64	34.3%
Total	230	17.3%
<i>Holland (1921)<sup>72</sup></i>		
<i>Contracted pelvises—</i>		
A. Not in labor	1202	1.6%
B. Early in labor, within 6 hours	389	1.8%
C. Late in labor	220	10.0%
D. After attempts at induction	35	14.0%
E. After attempts at delivery	107	25.7%
<i>Gordon (1928)<sup>73</sup></i>		
A. Not in Labor	343	3.5%
B. Early in labor	110	6.4%
C. Late in labor	403	7.7%
D. After attempts at induction	1	0.0%
E. After attempts at delivery	14	13.6%

Much of the preventable maternal mortality of today is due to errors in the choice of cesarean section and its improper handling in the four conditions outlined above. Some of these errors may be ascribed to a fairly equal balance of opinion and differences in the evaluation of statistical evidence. But there are two errors that one observes and encounters in statistical data that cannot be ascribed to an equal balance of opinion: (1) the performance of cesarean section without any demonstrable scientific indication; (2) the delivery by cesarean section of dead babies, and monstrosities, such as hydrocephalic and

anencephalic babies, etc., demonstrable by x-ray, where obstruction from below does not preclude a reasonably safe craniotomy, or absolute maternal indications do not obtain. The permission of such practice is a reflection on the understanding and the sense of responsibility of the general staff of a hospital.

The factors conditioning the mortality of cesarean section are: time of operation in relation to the beginning of labor, condition of the membranes (ruptured or unruptured), freedom from vaginal examinations, freedom from previous attempts at delivery from below, and the type of operation chosen to meet existing conditions.

From 1907 on, we have had special studies showing the importance of the time factor. Table VIII is self explanatory.

Convincing histologic and bacterial studies have accumulated that explain this differential mortality.

In 1917, J. Whitridge Williams<sup>70</sup> reported a histological study of fifty uteri removed at cesarean section, and concludes:

"The fact that inflammatory changes were present in 40 per cent of the specimens is very impressive and serves to demonstrate anew the danger of conservative cesarean section when performed at any other than the optimal time: namely, at an appointed date during the last days of pregnancy or within a few hours of the onset of labor in patients who have been examined only by those who observe an appropriate technic."

Again, Williams<sup>71</sup> reported in 1921 a critical analysis of twenty-one years' experience with cesarean section. In 183 cesarean sections, the mortality was 13 times greater in the first fifty than in the last 133. This was not due to change in operative technic but to avoidance of ascending infection by operating before the onset of or during the first hours of labor.

John W. Harris<sup>75</sup>, in 1922, made a study of the results obtained in cesarean hysterectomies (Table IX).

TABLE IX.

Duration of Labor	Total Spec.	Inflammatory Changes	Percentage
Before or within 6 hours of labor	27	1	3.7
6-18 hours	5	4	80.0
Late 1st and 2nd stage	28	18	64.3



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Harris and Brown<sup>26</sup> in 1927 made a study of the bacterial content of the uterus at cesarean section, with the following findings:

- "Uterus free of bacteria at end of pregnancy.
- "Uterus free of bacteria within 4 hours after onset of labor.
- "After six or more hours, bacteria could always be demonstrated in lower uterine segment.
- "Absence of vaginal examinations by no means insures that the uterus is free of bacteria.
- "Even intact membranes do not offer a thoroughly effective barrier to access of bacteria to the lower uterine segment.
- "Presence of normal temperature at time of operation cannot be accepted as a reliable sign that bacterial invasion has not already occurred."

All researches show the immense importance of the performance of cesarean section early in labor.

In addition to the above researches potential for the reduction of maternal mortality in cesarean section, we have had increasing proof that the low cervical operation is far more safe than the classical.

In 1914, four years after his introduction of his low cervical operation, Opitz<sup>47</sup> reported 433 such operations without a death. This report was interpreted with balance by those acquainted with the natural hazards of supravaginal hysterectomy, with which it has certain steps in common.

In 1919, and again in 1921, Alfred C. Beck<sup>8</sup> gave great impetus to the performance of the low cervical operation in the United States and compared the relative advantages of the classical and low operations:

## Classical

- Shorter duration.
- Ease of exposure.
- Fewer technical difficulties.
- Less troublesome delivery of the child.

## Low Cervical

- Better protection against hemorrhage, peritonitis and adhesions.
- Earlier convalescence, and less risk of subsequent rupture of the uterus.

Beck reported eighty-three low cesarean operations with a maternal mortality of 3.4 per cent.

By 1921, Munro Kerr and Eardley Holland, in Great Britain, were convinced of the advantages of the operation and Holland<sup>30</sup> voiced the following conclusions in regard to his future choice between the operations:

"My own future practice will be to employ the transperitoneal low segment operation for all cases, except where the lower segment is hard to get at, as in cases of shortness of the abdominal cavity accompanying diminutive stature or kyphosis (when the presenting part of the fetus is jammed down against the pelvic brim), and in fibroids."

The low cervical operation was further advanced by Dr. Joseph B. DeLee<sup>15</sup> of Chicago, who stressed the importance of the adjuvant use of local novocaine infiltration anesthesia for the possible prevention of acidosis and pulmonary complications.

TABLE X.

DeLee <sup>15</sup>	No. cases	M. M.
City of Chicago 1934 (all causes)		
Classics	438	5.5%
Low cervical	541	2.0%
Germany (Winter) (all causes)		
Classics	438	6.4%
Low cervical	3554	3.7%
Chicago Lying-In 1914-1936 (all causes)		
Classics	168	6.0%
Low cervical	1875	.96%

Skeel and Jordan,<sup>59</sup> from a survey of 1047 cesarean sections in the Cleveland registration area, state: "Our estimate of the mortality of simple obstruction is 2 per cent for the classical operation and 1 per cent for the low cervical." They give the summation of reports and surveys of hospitals as shown in Table XI.

TABLE XI.

	No. cases	M. M.
Classical	3468	5.2%
Low cervical	2753	2.5%
Courtiss and Fisher <sup>8</sup>		
Classical	409	6.4%
Low cervical	376	1.33%
Irving, F. C., <sup>32</sup> compilation of reports of 15 authors since 1930:		
Classical	3342	6.7%
Low cervical	2467	1.6%

Again, Gerald W. Gustafson,<sup>24</sup> in an eight-year survey of the cesarean sections at the William Coleman Hospital, says:

"The greatest single factor in reducing maternal mortality (of cesarean section) has been cervical cesarean. It is reasonable to assume that if the low cervical operation could be substituted for the classical operation in this country, the mortality from abdominal delivery would be cut in half."

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It seems strange that, with all of the accumulating data pointing to the marked superiority of the low cervical operation, the classical is still much the more frequently used of the two. The reason is likely that the occasional operator chooses the classical because it makes fewer technical demands.

With all of our increased knowledge based on verified data, the average operative mortality of cesarean section has been only slightly reduced since Routh's figures in 1911.

TABLE XII

Routh <sup>14</sup> :		
1891-1900 .....	M. M.	16.5%
1901 .....	M. M.	8.1%
1906-1910 .....	M. M.	6.1%
Lynch <sup>19</sup> (1930-1937)		
(12,955 cesarean section) .....	M. M.	4.1%
Irving <sup>23</sup> (11,491 cesarean section)...	M. M.	5.8%

This is a far cry from the possibilities suggested by the reports given in Table XIII.

TABLE XIII

Opitz <sup>27</sup> .....	433		M. M.	0.0 %
Greenhill <sup>28</sup> .....	108		M. M.	0.0 %
Arnot <sup>3</sup> .....	204		M. M.	0.0 %
Maxwell <sup>11</sup> .....	165		M. M.	0.0 %
Lazard <sup>24</sup> .....	289		M. M.	0.0 %
Seely <sup>25</sup> .....	87		M. M.	0.0 %
Phaneuf <sup>26</sup> .....	166		M. M.	.6 %
Daily <sup>14</sup> .....	500	(2 antemortem)	M. M.	.6 %
DeLee <sup>18</sup> .....	1875		M. M.	.96%
Courtiss and Fisher <sup>8</sup> .....	376		M. M.	1.3 %
Lazard <sup>24</sup> .....	507		M. M.	1.37%

Unfortunately, the average man is not impressed with average figures. He is guided more by the remarkable reports that are conspicuous and impressive from their very infrequency. He emulates these remarkable rates without emulating the factors of knowledge and skill that make these rates possible and without considering the factor of chance that enters into all statistics. Thus he has been led to increase his incidence tremendously. The incidence is now approximately ten times greater than it was in 1910. If one applies this increased incidence rate to the average mortality rates above, one can estimate that, where in 1910 there were 250 cesarean sections per every 100,000 hospital deliveries, we now have close to 2,500. If we accept Lynch's average mortality rate figure, this would mean that we now lose eighty-eight more women from cesarean section per 100,000

hospital deliveries than we did in 1910. If we accept Irving's figure, we lose 130 more women.

The rapid increase in cesarean incidence has been demonstrated in many researches.

TABLE XIV

Hawks <sup>27</sup> New York Nursery and Childs Hospital .....	1910	.3 %		
	1911	.2 %		
	1926	3.2 %		
	1927	2.7 %		
	1928	2.5 %		
Greenhill <sup>28</sup> .....	1916-1917	.6 %		
Chicago Lying-In .....	1928-1929	3.0 %		
Daily <sup>14</sup> Lying-In .....	1935	5.6 %		
Miller <sup>14</sup> Hartford General .....	1904-1911	.4 %	M. M.	16.0%
	1912-1916	1.4 %	M. M.	6.1%
	1917-1921	3.13%	M. M.	6.4%
	1921-1926	4.0 %	M. M.	2.8%

From the 1937 survey of the American College of Surgeons, MacEachern<sup>40</sup> gives the following figures of incidence:

PERCENTAGE OF CESAREAN SECTION

All hospitals considered .....	3.2%
Approved hospitals .....	3.0%
Non-approved hospitals .....	5.0%

Acting upon a foundation of even average understanding, judgment and technical ability, it is not to be wondered at perhaps that increasing reports of greater and greater incidence from recognized centers should lead men to question the wisdom of their past conservatism when they reviewed the many prolonged labors, difficult forceps, and versions that had caused them infinite anxiety and exhausting work, even though the outcome had been satisfactory for mother and child, and to question even more their wisdom in their unsuccessful cases as regards the life of the child. Again it is not surprising that when physicians not practicing obstetrics hear or read of such results as those of Opitz and others who report a long series with few if any deaths, they are led to believe that now cesarean section must be a comparatively safe operation. This belief is strengthened by the markedly increased number of cesareans that are being performed. This increased incidence has had a tremendous effect upon the public's idea of the safety of the operation. That the public has more and more come to believe that cesarean section is only another way of having a baby is evidenced by the increasing number of women who come in and ask for a cesarean

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and are surprised when their demand is refused on the grounds of their normality and the increased danger involved. They had thought their only problems were to decide which way they wished to have their baby and then to choose their surgeon. The increasing number of their friends who had had cesareans had led them to believe that little danger must exist, likely due to advances in surgical knowledge. These women have no way of evaluating the normality of their friends or the indications that determined the operations. This misunderstanding of the public is often embarrassing when one is taking great pains to refer a patient to some safe conscientious obstetrician in the community to which she is moving and she tells you that her friends have advised her to go to a remarkable obstetrician who is so skillful that he delivers most of his patients by cesarean section.

The tremendous and continuing variation in incidence of cesarean section has been well brought out in the literature:

TABLE XV

			Incidence
Mosher (1927) <sup>48</sup> Quotes Tottenham's recently collected data.	Jefferson Hospital Philadelphia ...	1- 6	16.66%
	Boston Lying-In...	1- 12	8.33%
	Bellevue Hospital	1- 97	1.03%
	Johns Hopkins Hospital .....	1-125	.80%
	New York Lying-In .....	1-285	.35%
	Swedish Hospital, Minneapolis ...	1-418	.24%
	Minneapolis General .....	1-671	.15%
	Toronto .....	1-861	.12%
	Smith of Indianapolis reports..	1- 19	5.20%
	Tiber, Minneapolis and St. Paul	1-385	.26%
New York Acad. of Medicine. (1933) <sup>49</sup> .....	Hosp. 1, 1,000 cases per year..	1- 19	5.30%
	Hosp. 2, 1,000 cases per year..	1-150	.40%
Lynch (1937) <sup>50</sup> ..	13 physicians, 1,229 deliveries.	1- 7	13.50%
	13 physicians, 1,229 deliveries.	1-615	.16%

These figures suggest that we should carry out some procedure in our hospitals that would tend to minimize the errors of each group.

Other evidence that points to this same conclusion is the variation of incidence in ward practice and private practice (Table XVI).

Such evidence, even after making allowances for the variants in the differential incidence in ward and consulting practice, suggests that there

TABLE XVI

	Incidence	Maternal Mortality
Hawks <sup>51</sup>		
Ward patients, 11,640 .....	1.2 %	2.8%
Private patients, 7,515 .....	3.8 %	3.5%
Miller <sup>52</sup>		
Ward patients, Dr. A. ....	2.62%	
Private patients, Dr. A. ....	23.25%	
Ward patients, Dr. B. ....	1.59%	
Private patients, Dr. B. ....	10.0 %	

must be some conditions inherent in private practice that make for poorer judgment and poorer results. One plausible reason for this situation is that increased anxiety and fatigue, not bolstered by sufficient consultation, stampedes the physician in his private capacity into choosing cesarean section unwisely where, were he rested and consulting himself, he would advise against it.

The most conclusive evidence that we should make a determined effort to make our hospitals safe for the parturient woman was brought out by the surveys of various cities and the mortality study of fifteen states.<sup>60</sup> Of these surveys, one of the first was that of Welz<sup>57</sup> in 1926. Welz brought out that in twenty-two years in Detroit this operation increased at a rate over seven times as rapid as the increase of population and that in Detroit the danger of cesarean section was twenty times greater than in all types of delivery, a mortality rate of cesarean section in 1925 of 13 per cent as against .66 per cent.

The comments of the Advisory Committee of the Fifteen States' study were:

"The very fact that cesarean section was done on one-fourth of all the women who died following operation for delivery suggests that there had been unwise selection of the cases for operation or of the types of operation, or both, as cesarean sections constitute only a small percentage of all operative deliveries in general.

"The most frequent indication for the cesarean section was some toxemia—in many cases eclampsia. Although the mortality from eclampsia in cesarean section cases is known to be higher than those treated conservatively, the fact was apparently not appreciated.

"Many of the cases resulting in death from hemorrhage were equally mismanaged. In many cases the operation was done after great loss of blood when the patient was in shock and without transfusion or other treatment for shock.

"Local anesthesia was used in surprisingly few cases.

"The tremendous mortality attending cesarean section throughout the United States warrants a careful review of the indications and the choice of operation.

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"The New York Committee<sup>46</sup> found that 19.8 per cent of all deaths, exclusive of abortion and ectopic, were preceded by cesarean section.

"The fact that the operation resulted in 80.1 per cent live babies, as against 59.7 per cent by other methods, led the Committee to conclude that this preponderance of live babies may be due to the tendency to accept fetal indications as valid for the performance of cesarean section and to hold the outcome for the fetus of greater importance than that for the mother.

"The Committee judged only 18 per cent of the deaths from cesarean section as not preventable. The great majority of the remainder were the result of faulty judgment and lack of skill on the part of the operator. The incidence was 2.2 per cent.

"This immoderate use of so dangerous a procedure is traceable to a variety of influences. The lack of appreciation of the surgical demands of the procedure itself, the unwarrantable widening of indications, and the possible use of the operation merely because of the desire on the part of some physicians to increase their surgical experience, are all contributory.

"The use of the classical type should be limited to the elective operation.

"Sharp reduction in the number of cesarean sections performed is to be strongly recommended. Only by this definite narrowing of its use to the legitimate occasions demanding it, as well as the provision of capable operators, can a decrease in these deaths be achieved."

The findings of the Philadelphia Committee<sup>51</sup> were essentially similar.

"The incidence in hospital deliveries was 2.58 per cent; maternal mortality, 5.52 per cent. 34.4 per cent of the deaths following operative deliveries were preceded by section. In all hospitals (fifty-five), 28 per cent of the deliveries were operative. The death rate per 1,000 deliveries was 9.1 per thousand; 1.03 deaths per thousand were due to cesarean section. 62.2 per cent of the cesarean deaths were deemed to be preventable."

Many suggestions have been made as to the most effective solution of this problem.

Welz<sup>47</sup> strongly advised hospital supervision in 1927.

In the Twentieth Year Book of the American College of Surgeons, 1933, under Standards of the American College of Surgeons for Hospitals Taking Obstetric Patients, we find the following standard:

"(6): Frequent consultations encouraged on obstetric service, a consultation made obligatory in all cases where major operative procedures may be indicated."

This ruling was not very successful in stopping abuses. It was a crystallization of the rou-

tine procedure of every conscientious and well-balanced obstetrician, but it did not affect those for whom it was intended. Again, it was resented by many obstetricians because they felt that there were likely as many abuses rampant in major operations in the realms of other surgical specialties, and they did not like being singled out for special supervision. Again, consultation did not always safeguard, as many were, in the words of Hawks—"often merely politely agreeable." Abuses keenly resented by obstetricians on a private staff were passed over because the obstetricians hesitated, for very obvious reasons, to bring individual instances to the attention of the general staff. If a general surgeon was called in consultation and asked to operate, he frequently performed the operation relying solely upon the obstetrical judgment of the physician calling him in. At any rate, the ruling was ineffectual and in 1936, in the Section of Obstetrics and Gynecology at the annual meeting of the American College of Surgeons, Dr. Frank W. Lynch<sup>48</sup> of San Francisco, in a paper entitled "More Conservatism in Cesarean Section," made the following observations and suggestions:

"Careful consideration should be given to the indications for and the contraindications of this operation, and the best method of performing it. Its application should be limited to those cases in which valid indications for its use exist. To achieve such consideration and consequent limitation, the American College of Surgeons should restate indications for cesarean section valid at the present time and instruct hospitals certified by the Board to permit the operation only after consultation with one of the chief obstetricians of the senior staff. Only by such means can the profession safeguard an operation which is at present a very dangerous procedure."

The latter ruling would work well in many hospitals. To my knowledge, for the past twenty-five years, it has been the unwritten rule that has been followed in the teaching hospitals of the University of Minnesota. However, its efficacy would always depend on the conservative tendencies of the senior staff members in any institution. From my observation and experience, it would not fit the mechanism of private practice in our hospitals.

Thompson and Krahulik,<sup>49</sup> this past year, suggested a hospital requirement of consultation when a labor extends over eighteen hours. Such a regulation, in conjunction with mandatory consultation before cesarean section at any time



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in labor, would have great merit, but from my observation it would still leave much to be desired, and I doubt if it would be carried out.

The best solution of the cesarean problem, to my mind, is contained in the Minimum Standards of the American College of Surgeons adopted in 1918. This is the provision—

"3-b: that the medical staff review and analyze, at regular intervals, their clinical experience in the various departments of the hospital, such as medicine, surgery and obstetrics and the other specialties; the medical records of patients, free and pay, to be the basis for such reviews and analyses."

These reviews and analyses should not be left to departmental meetings and to pathological conferences, the attendance at which is not so large and general as at the regular monthly staff meetings. Let the character of the work in the hospital in all of its departments in turn be a matter of general discussion.

Certainly, in regard to cesarean section, this routine will improve the character of practice in the hospitals more than do the present valuable and necessary mortality reports. At present, if the patient lives, a cesarean section is deemed to be a satisfactory achievement by the physician and the staff, whether or not the operation were necessary, unnecessary, or clearly contraindicated, or the operation chosen were of an incorrect type. The provision should solve the problem through the power of the influence of the general staff. It is influential rather than regulatory. It will make for greater care on the part of physicians and consultants alike when they know that their decisions and operative technics will be the subjects of routine review and discussion by the general staff no matter what the outcome of the operation.

Such analyses in regard to cesarean section should bring out the following data:

1. Was there a consultation and, if not, why?
2. What were the indications?
3. If the indication was pelvic contraction, what were the findings of pelvimetry, Munro Kerr maneuver, or x-ray?
4. Was the child dead or alive at the time of operation?
5. Did an x-ray give any evidence of deformity (hydrocephalus, etc.)?
6. Was the section elective, or after a test of labor, and how long a test?
7. Were the membranes intact or ruptured; and, if the latter, how long ruptured?

8. Had vaginal examinations or attempts at delivery been made?
9. Was there any evidence of infection at the time of section?
10. What was the blood picture? If signs of anemia, acute or chronic, obtained, were grouped and cross-matched donors at hand and used if indicated?
11. If the indication was eclampsia, why was cesarean section chosen in preference to conservative treatment?
12. If the indication was placenta previa, what measures had been taken to differentiate between the complete and incomplete varieties, and were grouped and cross-matched donors at hand and used as indicated? Was shock combated before operation?
13. If the indication was accidental hemorrhage, what decided the choice and were donors likewise present and used if indicated?
14. What operative technic was used and why?
15. Was the child at term, premature, or postmature?
16. What anesthetic was used and why?

Such reviews and analyses, in conjunction with our mortality reports, would soon tell us the character of work that is being done in our hospitals, and, in addition, would indicate most rapidly and convincingly the errors to be avoided—whether they be errors of well-meaning conservatism or well-meaning radicalism. Discussion would quickly bring out abuses and general staff influence would tend to eliminate them more effectively than would set regulations.

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The progress of tuberculosis in the body is determined by many definite and variable episodes and many more indefinite or contributing factors involving both host and parasite. It is a "battle on many fronts" with the weakest points giving way before the "enemy attack." All classifications, from Bard and Piery down to the present, bear witness to the fact that tuberculosis has many end results leading to many diverse classifications.

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## CUTANEOUS MANIFESTATIONS OF SYSTEMIC DISEASE\*

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A CAREFUL examination of the skin of the entire body and mucocutaneous orifices frequently may establish or confirm a diagnosis of various systemic diseases.<sup>8, 14-21</sup> It is impossible to consider all the cutaneous manifestations of systemic diseases, with many of which the internist is familiar. Thus, I need only mention the so-called exanthemata such as scarlet fever, the cutaneous manifestations of various vascular disturbances of the extremities such as occur in Raynaud's and Buerger's disease and so forth. I shall emphasize the diagnostic features of certain cutaneous conditions which are expressions of underlying constitutional disturbances. Treatment is described adequately in modern textbooks. References to controversial points of view are given in the bibliography.

It is important to keep in mind the structure and functions of the skin in order to appreciate the rôle which the skin plays in the general economy of the body.<sup>1</sup> The skin serves not only as a protective outer coat but also it is one of the most vital organs of the entire body. The rôle played by the skin in the regulation of body temperature through dilatation and constriction of its capillaries and through the action of sweating is well known. The skin also has to do with the water balance and the balance of various chemicals in the body. Thus, for example, there is a marked excretion of sodium chloride in the sweat after long bouts of fever from any cause. Also, the skin acts as a reservoir for the storage of glucose.

Unlike internal organs of the body, the skin is exposed constantly to changes of temperature and the effects of light which cause complex reactions in regard to the capillaries of the skin and also in regard to the physiochemistry of the skin.<sup>5</sup> The skin probably acts as a medium in adapting the vitamins to the use of the body through activation by sunlight. There is a close relation between carotene and vitamin A and melanin pigment; vitamin C and the content of copper in the skin; ergosterol, vitamin D, chole-

sterol and various sterols. Space does not permit us to dwell on the reticulo-endothelial system in the skin in its association with immunologic phenomena and various types of cutaneous tests in the diagnosis of local and systemic diseases of bacterial, chemical and allergic origins.

With the exception of cutaneous nevi and neoplasms of various types, local parasitic and fungous diseases and certain superficial infections and irritants, including various types of contact eczema, lesions in the skin are usually the expression of an underlying constitutional disturbance. Thus, even psoriasis, which for many years has been regarded as a purely cutaneous disease of unknown origin, has now been found to be associated in many instances with a definite type of rheumatoid arthritis beginning in the phalangeal joints, and in other instances it has been found amenable to treatment with large doses of vitamin D,<sup>2</sup> thus emphasizing both the systemic and the constitutional factors in this disease.

### Pigmentation of the Skin

Addison's disease usually is associated with generalized pigmentation of the skin which is especially pronounced in the folds of the skin, axillæ, nipples, genital and perianal regions and often in the mucous membranes of the mouth. Microscopically, there is an increase of melanin pigment in the basal cells of the epidermis and in the chromatophores of the cutis.<sup>10</sup> Pigmentation of the skin may be the first sign of Addison's disease.

Acanthosis nigricans is a rare disease in which the distribution of pigmentation is the same as it is in Addison's disease. In addition, however, there are accentuation of the normal cutaneous markings and hyperkeratosis and verrucous and papillomatous lesions develop in the regions of pigmentation. The histopathologic picture reveals changes which are diagnostic. Acanthosis nigricans is of two types: (1) the juvenile type, which runs a benign course, and (2) the adult type, which, in the majority of cases, is associated with malignancy involving the abdominal or pelvic organs. Apparently

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the changes in the skin are secondary to some involvement of the chromaffin-sympathetic system.

Hemochromatosis, or so-called bronze diabetes, also is associated with generalized pigmentation of the skin; the distribution of pigment is similar to that seen in Addison's disease. Clinically, the color of the skin seems to be composed of gray, blue and brown. Sometimes there is an increase of melanin pigment which masks the bluish-gray color and, when associated with a low blood pressure and symptoms of asthenia, results in confusion of it with Addison's disease. The diagnosis of hemochromatosis is readily established microscopically by demonstration of deposits of iron (hemosiderin) occurring in the propria of the sweat glands and at times these deposits of hemosiderin may outline the reticulo-endothelial system of the skin.

Arsenical pigmentation, resulting especially from the administration of pentavalent and inorganic arsenical preparations such as solution of potassium arsenite (Fowler's solution) or sodium cacodylate, presents a characteristic "raindrop" appearance together with associated keratoses on the palms and soles, which permit diagnosis on clinical grounds alone. Microscopic and histochemical studies will establish the diagnosis in borderline cases.

Argyria may result from local applications of preparations of silver to the mucous membranes, from ingestion of various silver salts, or from intravenous treatment with silver arsphenamines. Generalized argyrosis usually has a marked grayish hue that is diagnostic. As in hemochromatosis, however, there may be an increase of melanin pigment, which tends somewhat to mask the color. Microscopically, with darkfield illumination of a section stained with polychrome methylene blue, glistening refractile particles of silver are seen especially in the propria of the sweat glands but also throughout the cutis. These particles are uniform in size in contrast to relatively nonrefractile particles of bismuth, mercury and gold, which vary in size and are seen in cases of pigmentation after local applications or ingestion of these materials. Distinction between various types of pigmentation of the skin, due to heavy metals, also can be made by spectrophotometric methods as emphasized by Gaul and Staud.

Generalized melanin pigmentation of the skin

is also seen in association with tuberculosis of the abdomen affecting the chromaffin system, in many cases of generalized scleroderma, dermatomyositis, ochronosis and in association with various disorders of the thyroid gland, ovary, pituitary body and the liver. Mention also must be made of diffuse melanosis secondary to metastasis (melano-epithelioma).<sup>17</sup> The distinction is based on concomitant findings. The same is true of residual melanin pigmentation that follows many dermatoses and the pigmentation which results from deposits of hemosiderin after various purpuric and vascular diseases. The peculiar yellowish appearance of the skin in cases of pernicious anemia is well known, but less so is the dusky, purplish-red color of the skin of the face, neck and extremities characteristic of polycythemia vera. Jaundice, carotinemia and xanthochromia need only be mentioned.

Localized melanosis of the forehead may be the first sign of lymphoblastoma. Accentuation of existing freckles is seen in association with various endocrine disturbances. Cold cream pigmentation of the face, which is the result of deposits of mercury or bismuth in the creases of the skin, is not an uncommon occurrence.\*

### Pruritus

The itching skin, with or without excoriations or urticaria, is a frequent manifestation of systemic disease. Pruritus that is caused by parasites, contact or atopic (allergic) dermatitis, dermatitis medicamentosa, and various other dermatoses usually can be distinguished by concomitant findings. Pruritus vulvæ et ani, when occurring in women at about the time of the menopause, frequently is amenable to suitable endocrine therapy and thus becomes of constitutional rather than local origin. It is important to recognize the general pruritus which is associated with a dry, asteatotic skin and with too frequent bathing, encountered especially among elderly persons, or the acarophobia which is associated with arteriosclerotic changes. Too often, however, a diagnosis of neurotic excoriations is made in cases in which careful clinical and laboratory studies would reveal the presence of a serious systemic disease. Cutaneous pruritus frequently is associated with various endocrine disturbances, especially hyperthyroidism,

\*See Sutton and Sutton for a concise capitulation of local and general pigmentations of the skin.



and with disease of the liver and genito-urinary tract, diabetes, internal malignancy and especially with lymphoblastoma.

### Lymphoblastoma

Under the term "lymphoblastoma" are included mycosis fungoides, leukemia cutis (lymphatic, myelogenous, or monocytic in type), Hodgkin's disease and lymphosarcoma.<sup>8,16</sup> Mycosis fungoides is primarily a cutaneous disease; yet any of the other lymphoblastomas may have a primary (autochthonous) cutaneous origin, although they usually are secondary to metastasis or extension from within. Mycosis fungoides is characterized by infiltrative plaques or tumors presenting a gyrate or circinate arrangement. The other lymphoblastomas may simulate the clinical appearance of mycosis fungoides or may appear as discrete plaques, nodules or ulcers in the skin. In all types, exfoliative dermatitis is a common occurrence. More than a third of the cases of generalized exfoliative dermatitis occurring among patients more than forty years of age are due to one of the lymphoblastomas. Multiple types of lymphoblastoma may occur simultaneously in the same patient or the onset may be that of mycosis fungoides or leukemia cutis with the terminal picture of Hodgkin's disease or lymphosarcoma.<sup>8,16,21</sup>

Various authors list nonspecific and specific cutaneous lesions as occurring in 10 per cent to more than 40 per cent of cases of various types of lymphoblastoma. A toxic, nonspecific and, in most instances, generalized pruritus is seen, especially in cases of Hodgkin's disease. Other cutaneous manifestations of lymphoblastoma, specific or nonspecific in type, include eczematoid, psoriasiform, urticarial, herpetic, bullous, purpuric, hemorrhagic lesions; indurated ulcers; dystrophic changes in the nails and hair; localized regions of elephantiasis; various types of lesions of the mucous membranes and a localized or generalized increase in pigmentation of the skin. Herpes zoster is not an infrequent manifestation of a lymphoblastoma, especially of Hodgkin's disease, but it also frequently occurs among elderly individuals as the result of pressure or involvement of the posterior nerve roots by an internal malignant lesion of any type. The histopathologic picture of mycosis fungoides is distinctive. The cutaneous, microscopic picture of the other lymphoblastomas simulates that

seen in hemocytologic studies. Correlation of cutaneous, general, clinical, roentgenologic, pathologic and hemocytologic studies is often necessary in order to make a diagnosis of lymphoblastoma or to determine its type.

### Metabolic Disturbances of the Skin

It is not recognized generally that cutaneous xanthoma is usually a manifestation of systemic xanthomatosis involving various organs in the body.<sup>13,14</sup> It is important to distinguish between the different types of cutaneous xanthomas because of the varying prognosis and response to treatment. The most common type, xanthoma tuberosum, is characterized by multiple, yellowish to brown nodules or plaques that predominate on the extensor surfaces and are associated with hyperlipemia and hypercholesterinemia. In more than 40 per cent of the cases there is evidence of severe cardiovascular disease, especially angina pectoris and intermittent claudication. Involvement of the cutaneous xanthoma frequently results following an animal fat-free diet. Disseminate xanthomatosis is characterized by multiple, fine, papular lesions and plaques involving the flexural surfaces, especially the axillary folds, the mucous membranes of the mouth, pharynx and larynx and frequently the face. Tracheotomy or laryngotomy may be necessary because of obstructive phenomena. The concentration of lipoids in the blood is normal or subnormal. The condition frequently is associated with diabetes insipidus. Improvement in the condition does not occur under any dietary regimen. Xanthoma of the eyelids may be associated with either type of xanthomatosis mentioned; even in a series of cases in which xanthoma was limited to the eyelids there was evidence of a definite but moderate hyperlipemia in 80 per cent of the cases, and systemic disease, especially cardiovascular disease, frequently was present. Cutaneous xanthoma not infrequently is seen in association with various types of hepatic disease<sup>20</sup> or with diabetes. The microscopic picture in all these types is typical and is characterized by the presence of foam cells or xanthoma cells laden with lipoids.

Mention also must be made of so-called xanthic tumors of the tender sheaths and unusual forms of cutaneous xanthomatosis, such as nevo-xanthoendothelioma, lipid proteinosis (phosphatide lipoidosis) and necrobiosis lipoidica diabeti-

corum.<sup>6</sup> Cutaneous xanthoma has been described in cases of Hand-Schüller-Christian disease, in Niemann-Pick's disease (having to do with metabolism of phosphatides) and probably will be described in the future in relation to Gaucher's disease (having to do with cerebroside, especially kersin). Disturbances in lipid metabolism, including hyperlipemia and increase in cholesterol or phosphatides in the blood, also may occur, independent of any cutaneous manifestations, especially in various types of hepatitis and nephrosis and in myxedema.

A localized type of amyloidosis is seen in the form of lichenified plaques which usually are limited to the skin of the lower extremities. Systemic amyloidosis,<sup>7</sup> on the other hand, is a rare and fatal disease which first may manifest itself by the appearance of yellowish papules in the skin of the eyelids, face and oral mucosa. There is diffuse nodular involvement of the entire skin, mucous membranes and the walls of the larger blood vessels of the body, associated with a Bence-Jones proteinuria but without definite evidence of myeloma. Amyloid takes on a pinkish-red stain when a Congo red dye is used and therefore one may make a test by the subcutaneous injection, *in vivo*, of a 1 per cent solution of the dye in the vicinity of suspected deposits of amyloid.

In myxedema there are dryness and scaling of the skin and puffiness of the entire surface of the body. Microscopically, deposits of mucin are found in the cutis and in the subcutaneous tissue. O'Leary has described a form of localized myxedema that is characterized by the appearance of nonpitting, edematous, tawny plaques on the lower extremities. The condition is associated with the paradoxical symptoms of acute hyperthyroidism of a moderately severe degree. Microscopic examination reveals excessive deposits of mucin throughout the skin.

Various cutaneous manifestations also are seen in association with hyperthyroidism, Cushing's basophilic pituitary adenoma, tumors of the suprarenal cortex and disturbances of the ovaries and gonads. These consist chiefly of disturbances of pigmentation in the skin, hypertrichosis and development of acneform lesions.

Deposits of calcium that appear in the skin as localized plaques or as part of a systemic process may be a frequent manifestation of severe, generalized scleroderma.

### Photosensitization

There are several rare dermatoses in which there is a hypersensitivity to light of various wave lengths. There are at least three conditions which should be mentioned. Xeroderma pigmentosa<sup>15</sup> is a familial disease that is characterized by hypersensitivity to light and by spotted pigmentation of the exposed surfaces of the skin, senile skin changes and a marked tendency toward the development of basal-cell epitheliomas. In cases in which the condition is mild, it may be mistaken for ordinary freckles or lentigines. The affected individuals must be protected from exposure to the sun, either by application of protective creams or by shunning the light absolutely.

Pellagra is characterized by dermatitis limited to the exposed surfaces, by gastro-intestinal symptoms (diarrhea) and by a variable degree of dementia. There is marked pigmentation of the skin. The disease is associated with dietary deficiency, including a vitamin deficiency.<sup>6</sup> Various types of vitamin deficiencies may result in changes in the skin, especially in dryness, hyperkeratosis and disturbances in pigmentation.<sup>4</sup>

In cases of lupus erythematosus there is a very definite sensitivity to light which must be kept in mind when treating patients who have this condition.

The administration of sulfanilamide or similar preparations frequently renders a person photosensitive so that either a generalized dermatitis or an erythema and dermatitis may develop and may be limited to the exposed surfaces, simulating a picture of disseminate lupus erythematosus or pellagra.

### Infections

I wish to mention only a few of the numerous infectious diseases of the skin which are associated with systemic manifestations, or vice versa. These conditions may manifest themselves in the skin in the form of urticaria, erythema multiforme, bullous lesions, nodules, ulcers and granulomas.

Erythema multiforme may be an idiopathic and possibly an infectious process or it may develop as a toxic reaction after a major operation. I do not believe it is generally recognized, however, that a marked constitutional disturbance with a rise of temperature to 104 or 105°

F. (40 or 40.5° C.) and extensive lesions like those of erythema multiforme may develop among patients sensitive to various drugs, especially after the ingestion of any of the large group of barbiturates and coal tar derivatives.

Of the granulomas, I wish to refer briefly to only two diseases. Blastomycosis, which is endemic in the Middle West, may be limited to the mucocutaneous junctions of the mouth and nose.<sup>11</sup> In these situations the lesions usually lack the verrucous borders and characteristic milary abscesses and they appear simply as indolent, pyodermic or furuncle-like lesions. One can still readily demonstrate the budding organisms, however, in potassium hydroxide preparations. Systemic blastomycosis may first be manifested by small, multiple, cutaneous abscesses scattered over the skin of the body. Blastomycosis must be distinguished from torulosis, coccidioidal granuloma and sporotrichosis, as well as from tuberculosis verrucosa cutis and bromoderma.

Tuberculosis of the skin occurs in various forms which it is important to recognize from the standpoint of prognosis and treatment. There is a primary, cutaneous, tuberculous complex similar to the Ghon tubercle in the lung.<sup>9,12</sup> This usually occurs among children. In the beginning there is a nonspecific nodule or pyodermic lesion on the skin which may simulate a chancre. The tuberculin reaction is negative and there is no evidence of systemic tuberculosis. Within a few weeks lymphangitis and enlargement of the adjacent lymph nodes occur together with the development of a positive reaction to the tuberculin test with or without evidence of systemic tuberculosis. Among persons who already have tuberculosis, subsequent inoculation of the skin, either from within or from exogenous sources, usually results in the formation of an anatomic tubercule (tuberculosis verrucosa cutis). Other types of localized tuberculosis, which spread by continuity or contiguity of tissues and by secondary lymphatic dissemination, include lupus vulgaris, tuberculosis cutis orificialis and tuberculosis cutis colliquativa (scrofuloderma). Scrofuloderma represents an extension to the skin from an underlying tuberculous focus usually occurring in a lymph node or in a bone. Different localized types of tuberculosis differ in their response to treatment.

Among the hematogenous types of tuberculosis there is, first, tuberculosis cutis miliaris acuta generalisata, seen in infancy or early childhood, and terminating fatally; second, a large group of relatively benign hematogenous forms of tuberculosis occur as a rule among adults. These include lichen scrofulosorum, papulonecrotic tuberculids, tuberculosis cutis follicularis disseminata (lupus miliaris disseminatus faciei and rosacea-like tuberculid of Lewandowsky) and third, various forms of tuberculosis cutis indurativa, including erythema induratum, sarcoid of Boeck, sarcoid of Darier-Roussy and lupus pernio. Space does not permit a description of all these various types of lesions. In cases of sarcoid of Boeck there are multiple, indurated, brawny nodules in the skin associated with fibrosis in the lung and fibrocystic changes, especially in the bones of the terminal phalanges. The reaction to the tuberculin test is usually negative. This condition is also known as lymphogranulomatosis benigna or Besnier-Boeck Schaumann's disease.

### Comment

A careful examination of the skin is of value to the internist in the diagnosis of many systemic disorders and, conversely, the dermatologist must seek the aid of the internist and various laboratory procedures in the diagnosis and treatment of many dermatoses.

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## INTUSSUSCEPTION OF THE SIGMOID

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**I**NTUSSUSCEPTION occurs at several different levels in the gastro-intestinal tract but is chiefly thought of as a lesion to be considered in differential diagnosis of an acute abdominal condition in children under one year old. In adults and older children, intussusception of the ileum into the colon is seldom seen, but other areas of the gastro-intestinal tract do participate in such a catastrophe at times. C. W. Mayo,<sup>2</sup> writing in 1934 on chronic intussusception in the gastro-intestinal tract, states several levels at which intussusception was found, the sigmoid being the most frequent offender. Ten of the cases reported in his series were intussusceptions of the sigmoid and all ten were associated with a tumor of the pelvic colon.

It is true that in adult life, colonic intussusception is frequently predicated upon the basis of a tumor within the lumen of the colon. A long mesentery and inadequacy of the supporting ligaments of the pelvic floor, together with the presence of a sigmoidal tumor, are mechanical factors making adult intussusception possible. A colon contraction wave gripping a tumor within the lumen pushes the tumor area ahead and the invagination process is started. The length of mesentery by which this segment of colon is attached to its supporting structure and the laxity of the perirectal ligaments appear to be the only limiting factors in staying the invagination.

The character of the tumor apparently plays no rôle in this development but its gross anatomy does. A polyp which has a fairly long pedicle is more prone to initiate invagination than a sessile tumor, and likewise the size or bulk of the tumor influences the possibility of intussusception. Be-

cause of the fact that the sigmoid is a relatively frequent site for both carcinomata and polyps and also because of the long mesentery with which this segment of colon is often equipped, it is to be expected that the sigmoid will be the most frequent location for such an occurrence as intussusception.

The entire intussusception may and often does occur as one single event, but at times it would seem that it must be a progressive condition. If the first invagination is quite limited, it may well be that an increasing length of bowel becomes involved until some mechanical factor limits its progress. Histories of occasional proved cases of intussusception of sigmoid into the rectum would indicate that such is oftentimes the case. Such an intussusception may reduce itself or be reduced by the position assumed by the patient and later recur. Moderate degrees of this are infrequently seen through the sigmoidoscope and at times seem to be of no serious consequence to the patient.

Symptoms of this condition depend on the amount of sigmoid involved and the length of time the invagination has existed. Pain in the pelvis and rectum is invariable but the pain may be present a few hours and later disappear, suggesting, of course, that a reduction of the invagination has been effected in some way. Interference with normal bowel habits is expected and a partial obstruction does supervene. Passage of large amounts of flatus but no stool is frequently the story told the physician. Bleeding is uncommon unless the intussusception persists for a long period. A patient of mine presented this symptom, but in this case there was a protrusion of



the intussusception through the anus with an impaired circulation in the protruding mass.

*Treatment.*—The treatment must take care of the immediate emergency, and, secondly, must accomplish an eradication of the factors which brought about the intussusception. Usually, if the invagination is not too extensive and edema of the invaginating segment is not marked, a reduction may be effected in the cases where a tumor is absent, by giving an enema with the patient in the reclining position and the hips elevated. If the enema is of barium, the patient may be placed under fluoroscopic control and the reduction process visualized. Oftentimes in moderate intussusceptions of this type, a reduction may be effected by putting the patient on a proctology examination table, that is, in an inverted position, and introducing air under slight pressure through a sigmoidoscope. If due caution is used in the amount of pressure with which the air is forced in, this procedure is safe, and when effective, it is an easy way out of an emergency.

In patients on whom a reduction is not possible from below, an abdominal section is to be urged at once, rather than allowing a delay in the hope that the patient will accomplish a reduction himself in the course of shifting his position about in bed. The reverse is more apt to occur, that is, edema of the invaginated loop will become more extensive and the eventual reduction or other form of treatment made more difficult and dangerous.

If the abdomen has been opened for reduction of an intussusception, a plication of the mesentery may be done also in an effort to prevent recurrence. Two other surgical procedures have been used to correct anatomical defects which in certain cases seem to be of etiological significance. Excessive mobility of the sigmoid is at times overcome by stitching one of the longitudinal muscle striae for a few centimeters to the fascia of the psoas muscle as it comes downward over the brim of the pelvis. In the second procedure strips of fascia lata are inserted underneath the peritoneum in a criss-cross fashion, suturing the fascial ends at the pelvic brim. In this manner the peritoneal floor is elevated and the pouch of Douglas obliterated. This higher and tighter pelvic floor gives some measure of additional support to the lower sigmoid and upper rectum.

Where no sigmoidal tumor is found, one of

these devices will usually suffice, but in the event a tumor is present, it also must be dealt with and a multiplicity of methods is open for the choice of the surgeon here. The individual circumstances in each case must be judged and the method which can be adapted to the case in hand, used. Fulguration of polypi through a sigmoidoscope is satisfactory when the polypi can be reached and where biopsies have proved that malignant characteristics are absent. Fulguration of certain types of known malignant tumors may be advisable, but most of the proven ones are better suited to some type of resection. The circulation and amount of edema in the intussusception may dictate an immediate exteriorization of the sigmoid. Because of impairment of circulation of the invaginated sigmoid and the consequently high risk of doing an intra-abdominal type of resection, the so-called rubber band method was used on a case seen September 2, 1935. This type of treatment had been advocated and used as early as 1867, but until brought to the attention of contemporary surgeons by Dr. Mont Reid in 1933, it seems to have been abandoned. Since this report by Reid the method has been used for the treatment of rectal prolapse by Dr. Owen Wangenstein,<sup>2</sup> who reported one successful case in 1934, and Dr. J. K. Anderson,<sup>1</sup> who likewise reported one case in 1936.

### Case Report

The patient under consideration in this report was a farmer, white, forty-eight years of age, with a past history entirely free of any noteworthy illnesses. His family history had no bearing on his present trouble. His immediate complaint was a large mass protruding from the anus. His family physician was called and he was sent to the hospital at once. Because of obstruction and impaired circulation of the protruding loop of bowel a temporary colostomy had been done at once. This was functioning well when I was first asked to see the patient September 4, 1935. Local exploration of the sigmoid mesentery at the time of the colostomy showed no palpable lymph nodes.

Physical examination showed a poorly nourished, anxious appearing white male of forty-eight years with evidence of recent loss of weight. The temperature and respirations were normal but his pulse was sixty beats per minute. He was completely edentulous. The heart and lungs revealed no change from normal. There was a double-barreled colostomy present in the left lower quadrant of the abdomen and neither the liver nor spleen was palpable. Protruding from the anus was a partially gangrenous loop of sigmoid. This loop extended eight inches beyond the anus and at the outer end of the loop was a tumor mass which measured

## INTUSSUSCEPTION OF THE SIGMOID—BAYARD

5 by 3 by 3.0 cm. and was somewhat ulcerated. Biopsy of the tumor showed a papillary type of growth. There was considerable irregularity of the epithelium which, however, did not show marked activity in growth, and there were few mitotic figures present. Microscopic diagnosis was papillary adenocarcinoma.



Fig. 1. Intussusception of sigmoid with protrusion of loop showing papillary adenocarcinoma of distal end.

A finger could be inserted between the sphincter and the protruding mass all the way around the loop so that the point of origin of the intussusception was determined as being at the point of reflection of the peritoneum off the anterior surface of the rectum, some 5 inches above the anus. The protruding loop of sigmoid was edematous, weeping mucus and felt cold.

It seemed probable that an attempt to pull this intussusception up into the abdomen through an abdominal incision would produce a ruptured bowel. The method described by Reid for treatment of rectal prolapse was decided upon as offering a reasonable chance of success. Accordingly, on September 11, 1935, under a light spinal anesthesia, a rubber tube 1.25 inches in diameter and of rather firm consistency was introduced into the lumen of the invaginated sigmoid and passed up several inches beyond the point of origin of the intussusception. The tube was anchored in position by passing a silkworm suture through it and the perianal skin after satisfying myself there were no loops of ileum caught within the thickness of the invaginated sigmoid. Several thicknesses of a heavy rubber binder were slipped about the outside of the invaginated sigmoid and passed upward to the point where the invagination started. This was some 5 inches above the anus. The effect of the tightly applied rubber binder against the resistance of the rubber tube and surrounding sigmoid was to shut off the circulation from the loop of sigmoid distal to the binder. It was also expected that during the time the binder was in position an anasto-

mosis between the two thicknesses of sigmoid would be effected.

The protruding loop promptly became totally gangrenous and on the ninth postoperative day the entire loop had sloughed so that the rubber tube was then removed. The stump was rather thick and edematous but seemed to have a firm line of anastomosis. Hot boric irrigations and hot sitz baths were used daily until the large amount of mucous discharge ceased.

Because of financial stringency the patient was transferred to the U. S. Veterans' Hospital at Fort Snelling, on September 24, 1935. Examination six months later showed a scar at the point of anastomosis in the upper part of the rectum, but there was no decrease in the diameter of the lumen at this point to indicate that a stricture might form. The patient reported that he had experienced one episode two months after operation when there was a mild recurrence of his prolapse. This was reduced by his family physician at home and since then there had been no repetition of such an experience.

One year after this resection his colostomy was closed by a surgeon at the Veterans' Hospital and one year after this closure the patient again presented himself to me for examination. The rectum at the site of the anastomosis scar was still of normal diameter, the sphincter was perfectly competent and he claimed to have no variation from normal bowel habits. He was up to his customary weight and showed no evidence of recurrence of his malignancy.

The recorded cases treated in the manner described indicate a high degree of safety for the procedure, whereas the transabdominal resection for such a case would present a rather formidable risk. Provided due care is used in determination of absence of small bowel from the intussusception, there are no deterring factors to be considered. There may be some pain for a few hours after application of the rubber band, and likewise urinary retention may be troublesome for a short period, but no postoperative effects of any magnitude have been reported in any of the literature on this procedure. Because of this freedom from risk, the method should be given favorable consideration when one is confronted with such a lesion.

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## PREVENTION AND TREATMENT OF INCISIONAL VENTRAL HERNIA\*

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**E**VISCERATION, or disruption of an abdominal incision, will not be considered.

Incisional hernia occurs frequently following laparotomies requiring drainage or when devitalization of the lips of the incision occurs. It is also seen too often following clean elective operations with healing by first intention.

The following features influence the reparative process: type of incision, duration of operation, presence of drainage, drainage material, condition of the patient, amount of retraction during operation, introduction of infection into wound from within or without, type of suture material, and allergy to catgut.

Midline incision is most favorable to development of ventral postoperative hernia. It is commonly the incision of choice with many operators as it furnishes a relatively bloodless approach to the peritoneum; perhaps it furnishes better exposure for structures bilaterally located. It is easier to close. The presence here of poor blood supply is conducive to sluggish healing and in the midline the support to abdominal contents is entirely fibrous, for the peritoneum, subcutaneous tissues and skin are non-supportive. We commonly avoid the midline incision in all except operations on the urinary bladder and the duodenopyloric area, utilizing the right or left paramedian incision with retraction of the intact rectus muscle outward, never incising through its fibers and nerves. This permits anterior and posterior sheaths of the rectus to be incised as two separate and distinct structures in the great majority of cases. The frequent impossibility of distinguishing between the posterior rectus sheath and the peritoneum causes no concern whatever. Immediately following suture of the posterior sheath and peritoneum the intact rectus is released and falls naturally without strain or undue tension over the suture line, protecting the injured peritoneum with a living physiologic splint adapting itself to every motion and requirement of the patient; tightening when he coughs or strains; transmitting the lines of force in a vertical direction against the intra-abdom-

inal pressure. The anterior sheath is then sutured and splinting of the operative field is complete. The nerve supply of the rectus muscle is left without lasting damage and the structure of the muscle is practically uninjured. This incision is well adapted to operations on the biliary tract and to any operation below the umbilicus.

Prolonged operation with excessive exposure of cut tissue delays healing and favors infection. It is not possible to sterilize the skin, and culture of operative wounds usually shows bacterial growth despite towel protection and meticulous sterile technic. As the time element increases, the number of infecting organisms increases, the vitality of exposed tissues decreases, and the tissues become a more favorable culture medium for bacterial growth. Prolonged forcible retraction contributes to the traumatic devitalization of the tissues concerned. It is sometimes forgotten that only the defensive mechanism inherent in the patient prevents each operative wound from becoming grossly infected. Devitalized and thrombosed tissues favor the development of infection, delayed healing and a weakened abdominal wall, which may result in incisional hernia.

Drainage deliberately invites hernia by holding the divided abdominal wall mechanically apart, and yet so beneficent is the healing process of nature that we can and do drain where indicated, and the incidence of hernia following drainage is very small compared with the number actually drained. Incidence of hernia may be reduced by placing one or more through-and-through silk-worm gut sutures, mattressed or single, through the lips of the wound at either side of the drainage site. By through-and-through we mean through skin, fascia, muscle, and peritoneum. They are left untied or very loosely tied, protected by a rubber dam and collodion from contamination at their points of exit so that when the drain is finally removed they may be tied, bringing the lips of the draining sinus into apposition. They must be tied securely and the patient will appreciate 2 to 4 c.c. of evipal intravenously beforehand.

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Drainage material should be smooth and inert. Rough unprotected gauze should not be used. A rubber dam, coiled to a sausage-like mass (the familiar cigarette drain), or a sterile glove are excellent drainage materials, and traumatize the incision very little, as they do not adhere. Bile discharge is peculiarly apt to macerate and devitalize the incision, resulting in hernia. This can be minimized by the auxiliary sutures mentioned, plus constant suction on a set of Dakin's tubes introduced beneath the level of the peritoneum if large quantities of bile are being spilled. Constant mild suction can be obtained with an ordinary tonsil suction pump attached to a water faucet. The recovered bile can then be fed through a nasal tube to prevent depletion. This device protects the wounds in bile duct or urinary bladder operations equally well.

Infected wounds do not heal well. Healing in presence of infection is marked by scar tissue formation in the final stages of the process and scar tissue cannot be said to have the properties necessary to formation of a strong, firm abdominal wall. The principles of asepsis are well known. It must be borne in mind that a wound may be infected by careless spilling of bile, gall stones, urine, stomach or intestinal contents or by dragging an infected appendix or a pus tube across the lips of the wound.

Healing power of weakened anemic patients or those emaciated through long continued disease or neglect is less than that of a strong healthy individual. Such individuals should be built up if possible before operation. In many cases it is possible to spend a week or ten days in this endeavor and the result is well worth while as measured by increased tissue resistance and healing power. This is especially true in prostatic cases with retention and cystitis. The condition of the patient can almost always be improved by intravenous dextrose and saline, blood transfusion and forced feeding when possible. This applies especially to patients with cancer. A liver well stored with glycogen puts the patient in much better condition to withstand operative shock and produce new tissue. A weakened myocardium is much strengthened by 50 per cent dextrose in 100 c.c. doses twice daily preoperatively. Diabetics must be maintained sugar-free or healing will be sluggish. It is widely believed that postoperative retching and straining are productive of incisional

hernia. From our experience we are unable to concur with this, in the presence of the paramedian incision, unless drainage has been used. These unpleasant sequelae may be largely prevented by careful preoperative preparation, the substitution of volatilized for unvolatilized ether, free use of duodenal suction tube, morphine in  $\frac{1}{8}$  grain doses every four hours during the immediate postoperative period, and more frequent use of local or spinal anesthesia.

Suture material in the tissues is a foreign body and this applies to all forms of suture. We have a patient still discharging catgut following breast amputation twenty years ago. Whether one type of suture material is more conducive to hernia than another is problematical in view of recent findings. Silver wire is the least offensive. The wire must be introduced through-and-through and be carefully placed so as to approximate the layers of the abdominal wall or postoperative weakness will develop due to massive scar formation. Removal must not be attempted before the fourteenth day. Probably this material is best used in cases where incisional hernia seems almost certain, namely, in patients with large, fat abdomens, massive infections or poor musculature. The great majority of closures are done with catgut and this is very satisfactory. Continuous plain No. 1 is used in the peritoneum, employing only two knots; mattress or continuous chromic No. 1 (20-day) in the fascia; dermal, metallic clips or silk in the skin. If tension sutures are utilized, they should be through-and-through, of silkworm gut or silver wire. Knots are to be avoided as much as possible. We never use catgut larger than No. 1. There is evidence to show that allergy to catgut is occasionally present. It is rare, however, and usually results in evisceration rather than ventral hernia.

In closure, structures must be accurately approximated without interposition of tissue. Omental tags should not be included in the peritoneal line, and fat must be thoroughly cleaned off the fascia before the sutures are placed. Wide areas of fascia can be placed in position to unite by overlapping and imbrocating. This strengthens the wound tremendously. Where additional strength is required, mattress sutures should be freely used, although knots form a weak area in repair and are a potential source of infection.



### Treatment

Many patients with incisional hernia are excessively obese, a factor against successful correction of the condition by reason of increased abdominal pressure and stretching of the abdominal wall. These unfortunates should be reduced for sixty days before operation. Original operative scars should be excised. Where the peritoneum is redundant it must be trimmed to permit snug peritoneal closure. This is time-consuming, as the bowel and omentum are usually adherent to the peritoneum and releasing adhesions is an endless task. It is essential to remove the peritoneal sac, as in correcting inguinal hernia. Flaps of fascia are then fashioned, allowing an inch overlap from each side if possible. It is most important to clean the fascial sheath so that no tags of fat adhere. The recti muscles are then mobilized. It is claimed that they contribute more stability and support of the abdominal wall than does the fascia. If the recti are insufficient, due to retraction or destruction, and if the fascia is inadequate, a vertical incision is made through the anterior sheath parallel to the midline and well toward the lateral edge of each sheath.

This permits expansion of the sheath and the underlying rectus, facilitating closure. The lateral incisions are left unsutured and do not contribute toward a weakened abdominal wall. Closure of muscle is done with plain mattress sutures, loosely tied. Fascial sheaths are closed with interrupted mattress sutures in large bites, never with continuous sutures. Chromic No. 1 doubled is the suture of choice in our experience. In all long standing cases when the defect is great and the abdomen large and pendulous, we use fascial grafts in addition to the above, taken from the iliotibial tract of the fascia lata, one half inch wide and as long as conformation permits. They are transplanted immediately upon removal, being interlaced through the fascia closing the rupture. These grafts are utilized throughout the entire length of the hernial defect and as they grow they form

a massive protection against recurrence. This is the method of choice in our experience, but the operation is long and tedious and the chance of infection is multiplied. Hemostasis must be absolute before wound closure and we drain each case with subcutaneous rubber tissue without gauze. Following repair the patient is snugly encased in a many-tailed binder and not permitted out of bed for fourteen days.

### Case Report

(With Motion Pictures)

The patient was a woman, aged twenty-nine, height 5 feet 3 inches, weight 240 pounds, para 4. Three years ago she submitted to appendectomy through a midline incision, resulting in an incisional hernia upon which two unsuccessful surgical assaults were made before reaching our hands. Small bowel obstruction was in evidence. Her weight was brought to 220 in five weeks, whereupon repair of the hernia, measuring 8x5 inches, was undertaken according to the principles outlined above. The strangulated gut was released from massive constricting adhesions; flaps of peritoneum were constructed; the anterior and posterior rectus sheaths were isolated and dissected to form adequate healthy flaps. Many gallstones were present, but these were not molested. The peritoneum, posterior and anterior sheaths were overlapped and imbricated, respectively. Three strips of fascia, each  $\frac{1}{2}$  inch wide and 12 inches long, were taken from the iliotibial tract of the right thigh and immediately interlaced throughout the closure of the ventral hernia, thus transplanting a strip of fascia  $36 \times \frac{1}{2}$  inches. Narrow rubber strips were placed subcutaneously throughout the entire length of the abdominal and thigh incisions. Forty-eight hours postoperatively, the patient developed a severe bronchitis with a tremendous cough which we were only partially able to control. Despite this major complication the wounds healed firmly without sloughing of the transplants and she now possesses a firm, strong abdominal wall. In all such cases the fascia lata must be carefully closed or disabling hernia of the vastus lateralis will result.

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## "BENIGN" LYMPHOCYTIC MENINGITIS\*

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IN 1925 Wallgren<sup>20</sup> described, under the title "Acute Aseptic Meningitis," a self-limited benign inflammation of the meninges which occurred in Sweden. Since that time, many confirmatory articles have appeared both in the European and American literature under various titles such as acute lymphocytic meningitis, benign idiopathic serous meningitis, acute serous meningitis, benign aseptic purulent meningitis, epidemic meningitis serosa, benign lymphocytic meningitis, lymphocytic choriomeningitis and benign lymphocytic choriomeningitis. As has been frequently pointed out, it is still questionable whether all the cases reported were actually examples of the disease; however, they corresponded essentially to the clinical syndrome described by Wallgren.

In 1929, Krabbe<sup>12</sup> selected eleven cases which had recovered from what was supposedly tuberculous meningitis; he believed these cases to be fairly classical examples of aseptic lymphocytic meningitis. During the following year, Andersen and Wulff<sup>3</sup> reported a follow-up study of thirty-five cases. In two of these, signs of chronic encephalitis had developed which led the authors to believe that this syndrome was produced by the virus of epidemic encephalitis, which at times showed a predilection for the meninges. During this same year, Gunther<sup>10</sup> summarized the literature on this subject, recording 100 cases, of which thirteen were his own. Of the latter, two showed mild sequelæ, which suggested to him a possible relationship of this illness to poliomyelitis. The possibility of this same relationship was considered by the French authors and was expressed in a publication by Roch, Martin and Monedjikova.<sup>14</sup> In 1931, reports by Eckstein<sup>6</sup> and Schneider<sup>15</sup> again drew attention to the idea that a relationship existed between this syndrome and epidemic encephalitis.

The first reports in the American literature were published in 1929 by Viets and Watts.<sup>18</sup> Since that time, the interest in this syndrome has become widespread in this country, and cases have been reported by numerous investigators (Gager,<sup>9</sup> Dickens,<sup>7</sup> Bloedorn,<sup>8</sup> Viets and Watts,<sup>19</sup>

Abramson<sup>1</sup> and Hammes<sup>11</sup>). In 1934, Viets and Watts<sup>19</sup> published their third series of fourteen cases, one of which showed some residual involvement of the central nervous system.

By far the most extensive work on this subject, at the present time, has been carried out by Armstrong and his co-workers<sup>4</sup> of the National Institute of Health and by Rivers and his co-workers<sup>13</sup> at the Rockefeller Institute. Both groups of investigators have followed large numbers of individuals suffering from this ailment and have succeeded in isolating a virus as a causative agent in at least one group of these cases.

Briefly, the symptomatology of this condition has been characterized by its acute onset, its non-purulent character, and its localization in the meninges; hence, the name acute aseptic meningitis. It often begins as an infection of the upper respiratory tract associated with a mild headache, nausea and vomiting, and slight elevation of temperature. Meningeal symptoms soon follow, manifested by stiffness of the neck and a positive Kernig's sign. Occasionally, in the more severe cases there may result a delirium, convulsions and even stupor. The cranial nerves are usually not involved, and the neurologic examination is negative.

The disease runs a benign course for about ten days, with the temperature declining by lysis. Recovery is usually complete without residuals of any kind. In the mild cases, the temperature may not rise over 100° F., and the patients are comfortable aside from a headache and a slightly stiff neck. The exceptional case, however, may persist for a long period of time and definite signs of nervous tissue involvement may be manifested.

In general, the cerebrospinal fluid findings vary directly with the severity of the case. In the milder cases, the cells are few and exclusively lymphocytes, while in the more severe cases cells are very numerous and early in the disease may consist predominantly of polymorphonuclears. The spinal fluid pressure is usually normal. The proteins may be increased often to several times their normal values, while the spinal fluid sugar

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and chlorides have usually been reported as being normal. The serologic tests for syphilis are negative. The spinal fluid is sterile both upon direct examination and on the ordinary culture mediums.

The disease appears most frequently during the fall months and most commonly involves the younger age group. No definite proof is available as to the contagiousness of this affliction. Contacts do not seem to contract the disease, and most of the cases reported have occurred sporadically. None of the investigators engaged in the experimental work has become ill. However, in 1936, Toomey<sup>16</sup> reported an epidemic of a disease resembling lymphocytic meningitis, occurring in an orphanage in Cleveland and affecting seventy-five individuals in a period of twenty-one days. It has been suggested by some investigators that this infection might be transmitted through the upper respiratory passages, but the mode of transmission is still only in the stage of speculation.

The diagnosis of this syndrome depends considerably on one's ability to rule out the presence of any other condition which might lead to a meningeal irritation, and to determine the absence of any other disease that characteristically involves the central nervous system. The most common conditions which might be confused with this syndrome are tuberculous meningitis, abortive types of poliomyelitis and an occasional case of the meningeal type of epidemic encephalitis. However, one must keep in mind that there are also numerous other conditions which may produce a meningitis of a lymphocytic nature and may often leave one in doubt as to the diagnosis of lymphocytic meningitis as a primary disease.

A helpful procedure in the diagnosis of at least one type of this illness has been made available since the isolation of a specific virus by Armstrong and Rivers in certain cases of lymphocytic meningitis. In these cases, specific antibodies usually appear in the blood stream about six weeks after the onset of the illness, and the isolation of these antibodies is of great value in substantiating the diagnosis in at least this single form of the disease.

On the basis of time of collection of the sera and the results of the neutralization tests, Baird and Rivers<sup>5</sup> proposed a grouping of the cases presenting this syndrome as follows:

1. If the blood contains no neutralizing antibodies at the onset of the illness but contains them after recovery, the case is definitely proved to be a lymphocytic meningitis caused by this virus.

2. If the serum has not been tested during the illness but shows neutralizing antibodies during convalescence, then one may only presume the case is one of this specific type of lymphocytic meningitis, since some individuals show these specific antibodies even though they present no history of any ailment of the central nervous system.

3. Finally, the absence of neutralizing antibodies after recovery from the illness merely indicates either that the syndrome was secondary to some other condition or that if primary it was not caused by the virus isolated by Armstrong and Rivers.

These groupings are of special interest since the etiology of this condition is yet in the investigative stage. Eckstein,<sup>8</sup> in 1931, injected cerebrospinal fluid from three patients ill with aseptic meningitis cisternally into each of three monkeys. One developed a paralysis of the limbs, and its cerebrospinal fluid showed a pleocytosis; the injection of spinal fluid from this animal into other monkeys produced similar changes.

In 1934, Armstrong and Lillie<sup>3</sup> called attention to a virus which they had recovered from monkeys and with which they were not familiar. They encountered this virus in the course of transmission experiments in monkeys previously injected with autopsy material from a case of encephalitis. They were uncertain whether the infection originated independently in monkeys or was inoculated with material from human cases. These authors injected mice with small dilutions of various tissues of the infected monkeys and showed that the virus is harbored in large amounts in all the organs and tissues tested. Guinea pigs and white rats were also susceptible to infection by this virus.

Traub,<sup>17</sup> in 1935, recovered a virus from white mice which closely resembled that of Armstrong. Traub isolated this virus while working with equine encephalomyelitis. At first, its origin was doubtful. The author then took sixty healthy mice and inoculated each intracerebrally with sterile bouillon. Ten mice showed symptoms and pathologic findings characteristic of lymphocytic

meningitis in mice. This seemed to show that the infectious agent was carried by apparently healthy mice. The incubation period in mice was five to ten days. Guinea pigs were very susceptible to the virus following intracerebral, subcutaneous and intranasal injection.

Rivers and Scott,<sup>13</sup> in 1935, reported the isolation of a virus from two men who developed an illness characterized by the syndrome described as lymphocytic meningitis. Both patients made an uneventful recovery. The spinal fluid of each patient was inoculated intranasally, intraperitoneally, and intracerebrally into six mice. The mice became sick after one week. The authors then inoculated bacterially sterile brain material of these mice intracerebrally into other mice and succeeded in passing the virus serially through ten lots of mice. It was discovered from various neutralization experiments that the Armstrong, Rivers, and Traub viruses were immunologically identical.

In the human cases, Rivers found this virus in the spinal fluid only during the first ten days of the illness, while the neutralizing antibodies appeared in the blood after about six weeks. Armstrong and Wooley<sup>4</sup> have reported a case of aseptic meningitis from which they obtained neutralizing antibodies from the blood serum as long as four years and seven months following recovery. It appears, therefore, that in at least some cases of so-called lymphocytic meningitis, a specific virus has been isolated. Armstrong and Dickens suggest that in these cases the disease be now called lymphocytic choriomeningitis, since they were able to grow this virus in the chorio-allantoic membrane of the chick embryo.

It is well to emphasize that this isolated virus is the cause of only a few cases presenting the clinical picture of lymphocytic meningitis. Baird and Rivers failed to find activation in the spinal fluid of forty-one patients suffering from this illness. They were also unable to isolate neutralizing antibodies from the sera collected from twenty-one patients who had recovered. Armstrong and Wooley had similar experiences. Of fifty-eight cases diagnosed as lymphocytic meningitis, they were able to demonstrate antibodies in only 32 per cent. It appears that the clinical entity of lymphocytic meningitis probably is caused by more than one etiologic agent. It seems preferable, therefore, to refer to the

condition under the general heading of lymphocytic meningitis, and to further classify the cases etiologically as other causative agents are discovered.

There are no specific therapeutic measures. However, the general supportive procedures are of value until the patient is over the acute phase of the illness.

At the University of Minnesota Hospitals ten cases of lymphocytic meningitis have been observed within the past ten years. In one of these (Case 1), antibodies against the virus of lymphocytic choriomeningitis were demonstrated in the blood serum. In three of the other cases the neutralization tests were done on the sera five months, one year and two years, respectively, following recovery, with negative results.

*Case 1.*—S. L., a forty-nine-year-old Norwegian man, by occupation a farmer, was first admitted to the hospital on July 26, 1937, because of a constant frontal headache which had been present for two weeks, during which time it had increased in severity. This was accompanied by a feeling of general malaise. Two days prior to admission, stiffness of the neck appeared. He had had no premonitory symptoms. His previous health had been good. There was no family history of infection or illness.

On admission the temperature (by mouth) was 102° F., the pulse rate was 80 and the respiratory rate 20. The patient was nervous, apprehensive, and complained of severe frontal headache. Moderate rigidity of the neck and back was present and Romberg's sign was positive. The Achilles reflexes were absent and the other deep tendon reflexes were diminished though equal. The rest of the neurologic examination revealed nothing of consequence. The general physical examination was entirely negative. Skin tests with old tuberculin in a concentration of 1:100 gave negative results. X-ray examinations of his chest, skull and sinuses were also essentially negative.

Cerebrospinal fluid, obtained by lumbar puncture, was examined on a number of occasions during the course of his hospitalization. The cell count per cu. mm. varied from 40 to 1,500 with a great predominance of lymphocytes. The spinal fluid protein was elevated, the highest value being 217 mg. per 100 c.c. There was a reduction in the spinal fluid sugar, the lowest value being 23 mg. per 100 c.c. The bacteriologic studies on the spinal fluid were extensive and included, in addition to the routine smears and cultures, a search for the higher fungi as well as the inoculation of guinea pigs. All of these examinations were negative. Blood smears showed 65 to 78 per cent neutrophils and 16 to 30 per cent lymphocytes. The hemoglobin concentration was normal. The sedimentation velocity of the red blood cells was normal. Blood cultures were repeatedly sterile. The complement fixation and flocculation tests of the blood for



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syphilis were negative. Agglutination tests of the blood for typhoid, paratyphoid, melitensis, tularemia, and dysentery were negative, as was also the Weil-Felix reaction. Blood drawn approximately one month after the patient entered the hospital was sent to Dr. Charles Armstrong of the National Institute of Health, and he reported that the serum contained a strong concentration of antibodies against the virus of lymphocytic choriomeningitis.

The original diagnostic impression was that of a meningitis or an encephalitis of an undetermined type. As a precautionary measure, sulfanilamide was given parenterally daily during one week of his hospital stay, and during this period the patient's headache and cervical rigidity seemed to become less pronounced. The temperature during the first few days in the hospital was somewhat septic, reaching 104° F. on one occasion. He continued to complain of a constant frontal headache, which varied in intensity but was usually quite severe. The ordinary anodynes gave little relief and codeine was necessary to control his discomfort. Stiffness of his neck disappeared shortly after admission. Although weak, he was up and about part of the time. He was dismissed as improved after three and one-half months of hospitalization with a diagnosis of lymphocytic choriomeningitis.

He was seen again eight months later, at which time he reported that he had continued to have headache, generalized weakness and nervousness. In addition he complained of a mild equilibratory disturbance, tinnitus on the left, occasional epigastric distress and constipation. He appeared ill disposed and was particularly distressed by the headache. His general physical condition was unchanged except that he was somewhat more gaunt than formerly. The neurologic abnormalities at this time were a positive Romberg, slight horizontal nystagmus on lateral deviation of the eyes, stiffness of the back, absent abdominal reflexes, diminished patellar reflex on the left, absent Achilles reflexes and slight impairment of superficial sensibility over the entire left lower extremity. Laboratory studies, with the exception of the cerebrospinal fluid findings, were entirely negative. The spinal fluid contained 144 cells per cu. mm., of which 81 per cent were lymphocytes; the protein was 174 mg. per 100 c.c.; the sugar was below 8 mg. per 100 c.c. Blood was again sent to the National Institute of Health, and Dr. Jerald G. Wooley reported that there was still a strong concentration of lymphocytic choriomeningitis virus antibodies present.

*Case 2.*†—L. W., a three-year-old child who entered the hospital on September 14, 1938, was well until eleven days previously, when he stepped on a nail, receiving a foot wound. Treatment of this injury was limited to cleansing with turpentine and bandaging. Five days later he developed a headache, anorexia and constipation. Headaches and malaise continued but the patient was not completely confined to bed. During the next few days his temperature became

elevated, and he developed some vomiting and stiffness of the back. On the day of admission rigidity of the neck appeared. His past history disclosed nothing of significance. The family history was non-contributory.

On admission to the hospital his temperature was 102.4° F. (by rectum), the pulse rate 130, and the respiratory rate 22. He appeared ill, was hyperesthetic and irritable. Except for some pharyngeal injection the general physical examination was negative. The neurologic examination revealed a moderate stiffness of the neck and back, some muscular rigidity involving the extremities, slight muscle tenderness in the lower limbs, questionably positive Kernig's sign and exaggerated tendon reflexes.

Urinalysis was negative. The hemoglobin was 89 per cent; the leukocyte count was 13,300 with 61 per cent neutrophils and 39 per cent lymphocytes. The serologic tests for syphilis were negative. Lumbar puncture the day of admission revealed clear cerebrospinal fluid under a pressure of 18 mm. of mercury, but the patient was not well relaxed at the time of this reading. There were 146 cells per cu. mm.—all mononuclears. The Nonne test was positive. The sugar was 76 mg. per 100 c.c. of fluid. The colloidal gold reaction was negative. Eight days later the cell count had decreased to 8 per cu. mm. (6 mononuclears and 2 neutrophils), the protein was 43.6 mg. per 100 c.c. and the sugar 82 mg. per 100 c.c. The bacteriologic examinations, which were done on both specimens of fluid removed, were negative. For technical reasons serum obtained from this case could not be tested for neutralizing antibodies.

Improvement was noted the day following admission; the neck was less rigid and there were no signs of spasticity of the extremities. The temperature rose to above 100° F. rectally during each of the three days following admission, but thereafter was normal. By the fourth hospital day the patient was symptom-free. He received no treatment other than general supportive measures and was discharged from the hospital nine days after admission.

*Case 3.*†—J. P., a seven-year-old white boy, became ill three days prior to admission to the hospital on August 29, 1938, when he suddenly developed a frontal headache accompanied by vomiting. The following day his temperature had risen to 103° F., and a diagnosis of influenza was made. He developed anorexia, constipation and photophobia. There was some improvement for part of the next day, and he felt well enough to be up, but in the evening he again felt ill and returned to bed. On the morning of the day he went to the hospital his temperature was 105° F., he was drowsy and his neck was stiff. The anamnesis disclosed that an illness called influenza was prevailing in his community at the time, but there was no definite history of exposure to the infection. His previous health had been good.

On admission his temperature was 101.8° F., the pulse rate 94, and the respirations 18. He was rather drowsy, looked feverish and was quite obviously ill. His throat was red but the general physical examina-

†These cases are presented through the courtesy of Dr. Irvine McQuarrie, Professor and Head of the Department of Pediatrics.

tion was otherwise negative. The significant neurologic findings were slight retraction of the head, cervical rigidity, questionable Kernig's sign, suppression of the tendon reflexes, absent abdominal reflexes, a positive Babinski on the right and a questionably positive response to plantar stimulation on the left.

The laboratory studies revealed a negative urinalysis. The leukocyte count was 22,700 with 84 per cent polymorphonuclears. The red blood cell sedimentation rate was rapid. A blood culture was sterile. The serologic tests for syphilis were negative. Non-hemolytic streptococci and staphylococci were found on nose and throat cultures. There was no reaction to old tuberculin 1:1000 and an x-ray of the chest was negative. The cerebrospinal fluid obtained on lumbar puncture contained 110 cells per cu. mm., of which 93 per cent were mononuclears; there were 73 mg. of protein, 63 mg. of sugar, and 730 mg. of chlorides in each 100 c.c. of the fluid; the bacteriologic studies, which included direct examination and culture, were negative. Two days later the cell count was 82 per cu. mm. (3 neutrophils and 79 mononuclears); the protein was 108 mg., the sugar 84 mg., and the chlorides 710 mg. per 100 c.c. of spinal fluid. At a still later date there were 35 cells per cu. mm. (3 neutrophils and 32 mononuclears). The spinal fluid remained sterile. Neutralization tests on the serum for antibodies against the virus of lymphocytic choriomeningitis could not be done because the sample of blood was inadvertently contaminated.

The patient received sulfanilamide during the first five days of his hospital stay. He was also given intravenous fluids. The temperature remained elevated for a week, the highest reading being 105° F. The patient was restless, irrational and took food poorly. Two days after admission the neck rigidity disappeared, and the only reflex abnormality was a positive Babinski on the left side. Improvement was gradual, although listlessness continued for some time. He was discharged after a hospital stay of twenty-one days. No record was made of his neurologic status at the time of discharge, but this was entirely normal upon examination one month later.

*Case 4.*—V. A., a white man eighteen years of age, felt well until seventeen days prior to his hospital admission, when he injured his neck in a wrestling match. Subsequently he developed pain and stiffness in his neck, especially on motion. During the next few days a severe frontal headache appeared accompanied by anorexia, nausea, vomiting, and constipation. He felt as though he had a fever part of the time. His symptoms had begun to improve prior to his admission to the hospital on June 11, 1932. The past history revealed nothing unusual.

The general physical examination was negative. The neurologic abnormalities consisted of some hyperemia of the optic discs with blurring of the margins, stiff neck and positive Kernig's sign. The temperature and pulse were normal.

The urinalysis was negative, as were also the blood studies. A radiograph of the cervical spine was nega-

tive. Lumbar puncture was first performed on the day following admission, which was eighteen days after the onset of his illness. A cloudy fluid was obtained, which contained 750 cells per cu. mm., mostly lymphocytes. The Nonne and Noguchi tests were positive; the colloidal gold reaction was negative; bacteriologic studies, including guinea pig inoculation, failed to demonstrate the presence of any microorganisms. The next day the spinal fluid was clear, but contained 150 cells per cu. mm., of which approximately 95 per cent were lymphocytes. No bacteria were found on stained smears. The blood and spinal fluid serologic tests were negative for syphilis.

The patient was given antimeningococcal serum following the first lumbar puncture. His symptoms gradually subsided, and in one week he felt entirely well. He refused to undergo any further treatment and left the hospital at the end of the second week.

*Case 5.*—M. H., a twenty-three-year-old white woman who came to the hospital on July 4, 1929, was well until ten days before. At that time she developed a headache, slight fever and a sense of stiffness in her right extremities lasting for several days. One week later her headache recurred and her temperature rose to 101° F. Subsequently she experienced anorexia, nausea and vomiting, and later stiffness of her neck. Her past health had been fairly good. The only point of interest in her family history was that a sister had tuberculosis, but the patient's recent contacts with her were only casual.

On admission the patient's temperature was 101.6° F., the pulse rate 80, and the blood pressure 114 systolic and 80 diastolic. She appeared very ill and complained of severe headache. The general physical examination disclosed no remarkable abnormalities. The only significant neurologic finding was cervical rigidity. Kernig's sign was negative.

The urinalysis was negative except for numerous leukocytes. The blood count showed a normal red cell count, but the white cells were 17,200 with 90 per cent polymorphonuclears and 10 per cent lymphocytes. Serologic tests of the blood and spinal fluid for syphilis were negative. Opalescent cerebrospinal fluid was obtained on lumbar puncture under pressure of 170 mm. of water; this contained 850 cells per cu. mm., of which 80 per cent were small lymphocytes, 8 per cent large mononuclears, and 12 per cent polymorphonuclears. The Nonne and Noguchi tests were positive, as was a qualitative determination of the sugar; no bacteria were demonstrated. On the following day the cerebrospinal fluid was still opalescent, and the cell count was 350 per cu. mm., with a preponderance of lymphocytes. Her blood leukocyte count decreased to 10,700. Several days later her spinal fluid pressure was 20 mm. of water; the fluid was almost clear, but still contained 135 cells per cu. mm. The Nonne and Noguchi tests were now negative. The spinal fluid was inoculated into a guinea pig, and was reported later to show no evidence of tuberculosis. Thereafter the spinal fluid findings gradually returned to normal, and two weeks after entrance to the hos-

## "BENIGN" LYMPHOCYTIC MENINGITIS—SKOGLAND

pital the cell count had decreased to four per cu. mm.

Within a few days after her admission the patient was feeling much better and her temperature was normal. The neck rigidity disappeared by the fifth hospital day. For ten days prior to her dismissal she was entirely free of signs and symptoms of her illness. No treatment was given except for ordinary supportive measures.

*Case 6.*—L. W., a forty-five year old married woman, two weeks prior to her entrance to the hospital on November 28, 1936, suddenly developed headaches, nausea, and vomiting. The following day her neck was stiff, and she had an elevated temperature. Her local physician performed several lumbar punctures with some relief of the symptoms. The spinal fluid was said to have been cloudy, but no organisms were found in it. Serum was given but the type was not reported to us. During the week immediately preceding her admission to the hospital, she noticed blurring of vision, difficulty in swallowing, photophobia, and backache; her headaches, however, became less pronounced. She had previously been in fairly good health, although several years before she had suffered from some motor disturbance, the nature of which was not definitely diagnosed. There was no history of any other recent ailment nor of definite exposure to an infectious illness.

On admission to the hospital she complained of frontal and occipital headache but did not appear acutely ill. Her temperature, pulse, and respirations were normal. The blood pressure was 164 systolic and 106 diastolic. Photophobia existed and a slight vertical nystagmus was elicited. The rest of the cranial nerves were negative. The tendon reflexes were generally exaggerated, there was unsustained clonus at both ankles, and the Babinski's sign was questionably positive bilaterally. The rest of the neurologic examination was normal, as was the examination of the other body systems. A Mantoux test was negative.

Urinalysis did not reveal any abnormality. The hemoglobin was 72 per cent and the leukocyte count 6,000 with a normal differential. The sedimentation velocity of the red blood cells was markedly accentuated. The complement fixation and flocculation tests of the blood for syphilis were negative. The fasting blood sugar was 152 mg. per 100 c.c. On the day of admission lumbar puncture was done and clear fluid was obtained under no increase in pressure; this fluid contained 31 cells per cu. mm., 86 per cent being mononuclears. Smears and culture of the fluid failed to reveal organisms, and guinea pig inoculation for tuberculosis was negative. Roentgenographic studies of the skull and chest were negative.

The patient's discomfort abated quite promptly, and within a week after entrance to the hospital she felt well. The abnormal physical findings also disappeared. At no time did she have a fever. The blood pressure fell to 110 systolic and 74 diastolic. Her cerebrospinal fluid was reexamined approximately one and two weeks after admission, showing on these occasions 28

and 33 cells per cu. mm. respectively, all mononuclears. The spinal fluid protein and sugar values were normal; the colloidal gold reaction and the tests for syphilis were negative. No organisms were ever demonstrated in the spinal fluid. Two and one-half weeks after admission she was released from the hospital. One year later she seemed to be entirely well, and at this time her serum was examined by Dr. Wooley of the National Institute of Health for antibodies capable of neutralizing the virus of lymphocytic choriomeningitis, with negative results.

*Case 7.*—G. P., a twenty-year-old woman, was well until the day before admission to the hospital on September 23, 1935. At that time she suddenly developed a severe generalized headache, which increased in intensity and was associated with projectile vomiting and stiffness of the neck. She had had no recent exposure to any infectious illness. Her previous health had been good. There was no history of a tuberculous infection nor any earlier nervous ailment. Tuberculosis had caused the death of a sister seven years before, and of her mother three years before. The family history was otherwise essentially negative.

Examination revealed a well developed, well nourished patient, who complained bitterly of headache. Her mouth temperature was 102° F.; the pulse and respirations were normal. Neck rigidity was present and Kernig's reaction was positive. The examination by body systems otherwise gave negative results.

Laboratory studies showed the hemoglobin to be 95 per cent, and the leukocyte count was 9,600 with a normal differential. Urinalysis was negative. The complement fixation and flocculation tests of the blood for syphilis were negative. Cerebrospinal fluid obtained by lumbar puncture the day of admission contained 575 cells per cu. mm., of which 96 per cent were mononuclears. The smears of this fluid were negative, and no organisms were found on culture. A radiograph of her chest disclosed calcified mediastinal glands on the right; films of the skull showed no abnormalities.

It was assumed that she had a meningitis; and because of the possibility that it might be meningococcic, specific antitoxin was administered intrathecally the day of admission and on the following day. Subsequent to this therapy the pleocytosis rose to 4,600 cells per cu. mm., and for several days the differential count showed 85 to 90 per cent neutrophils. On the fifth hospital day the cell count decreased to 175 per cu. mm., all of which were mononuclears. The sugar and chlorides were repeatedly normal, while the protein content was moderately elevated. No microorganisms were demonstrated in any specimen of cerebrospinal fluid. Guinea pig inoculations were negative for tuberculosis. Clinically she seemed to lose ground during the first few hospital days. She became stuporous, developed bilateral papilledema of about one diopter, and presented greatly exaggerated patellar reflexes. These findings disappeared rapidly, and in less than a week following her admission she was entirely asymptomatic. Her temperature never rose above 103° F.



(oral). After the fourth hospital day it remained below 100° F. Two weeks after her admission the spinal fluid contained 30 cells per cu. mm., 70 per cent of which were mononuclears; the bacteriologic studies remained negative. The tests of the spinal fluid for syphilis were negative, as was the colloidal gold reaction. She was dismissed from the hospital after a stay of three and one-half weeks, feeling entirely well.

*Case 8.*—H. R., a twenty-three-year old man, became ill thirty-six hours prior to his admission to the hospital on August 14, 1935. He developed a headache and had some soreness of the throat. Later he noticed malaise, weakness of the legs, dysuria, abdominal distress, and vomiting. The past history revealed nothing of a contributory nature. There was no recent exposure to any infectious disease.

Examination showed a well developed, well nourished individual who appeared restless and uncomfortable. His temperature (oral) was 100.4° F., and the pulse rate was slightly elevated. The only positive findings on physical examination were slight injection of the throat, a minimal amount of neck rigidity, and generalized suppression of the tendon reflexes.

Laboratory studies revealed a negative urinalysis, normal hemoglobin and a blood leukocyte count of 8,800 with a normal differential. The complement fixation and flocculation tests of the blood for syphilis were negative. The agglutination tests for typhoid, paratyphoid, undulant fever, tularemia, and dysentery gave negative results. On lumbar puncture the day after admission, clear cerebrospinal fluid was obtained under 18 mm. of mercury pressure; this contained 30 cells per cu. mm., all mononuclears. The protein content was 38 mg. per 100 c.c., the sugar 84 mg. per 100 c.c., the chlorides, 716 mg. per 100 c.c. Both the colloidal gold reaction and the spinal fluid serologic tests gave negative results.

On the second hospital day he felt much improved, and his temperature and pulse were normal. He received no treatment other than bed rest. He was entirely free of symptoms for several days prior to dismissal on the sixth day after his admission. Two years later he was still well, and at this time his blood serum was examined at the National Institute of Health for antibodies against the virus of lymphocytic choriomeningitis, but the results were negative.

*Case 9.*—E. S., a twenty-two-year-old University student, awoke with a severe frontal headache and backache two days before coming to the hospital on May 2, 1937. She had general malaise, and after being up for a few hours returned to bed, remaining there until entrance to the hospital. Prior to the time of admission she had developed stiffness of the neck and some dizziness. There were no other symptoms, either premonitory to or accompanying this illness. However, a year previously she had been found to have a positive Mantoux test and roentgenologic evidence of incipient tuberculosis of both upper lobes, the degree of activity being questionable. This disorder was asymptomatic, and no specific treatment was given. Her phys-

ical condition otherwise had been good. There was no history of recent contact with an infectious disease. The family history revealed nothing of import.

On examination the only definite positive findings were stiffness of the neck and a positive Kernig's sign. There was an equivocal hyperemia of the right optic disc. The rest of the neurologic signs were normal, as was the general physical examination.

Laboratory studies revealed a negative urinalysis. The white blood count was 10,000 with 70 per cent neutrophils. The hemoglobin was 80 per cent. On lumbar puncture, clear cerebrospinal fluid was obtained under normal pressure. No pellicle formed. The cell count was 83 per cu. mm., but the types of cells were not differentiated; the sugar was 75 mg. per 100 c.c., the protein 62 mg. per 100 c.c., and the colloidal gold reaction showed a midzone curve. This fluid was sterile bacteriologically. The tests for syphilis were negative on both the blood and spinal fluid. A radiograph of her chest showed the tuberculous condition to be unchanged from the year before.

Her headache was slightly improved on the day following admission. On the second day of her hospital residence the Kernig's reaction became negative, and by the fourth day there were no positive physical findings. The temperature readings were normal. Cerebrospinal fluid obtained three days after admission contained 250 cells per cu. mm., of which 98 per cent were mononuclears and 2 per cent neutrophils; the protein content was slightly high; the sugar and chlorides were normal; smears and culture were negative; guinea pig inoculations disclosed no evidence of tuberculosis. On the sixth day there were still 290 cells per cu. mm., all being mononuclears, but at the end of two weeks this number had fallen to 47 cells per cu. mm., 98 per cent of which were mononuclears. The routine bacteriologic studies continued to be negative. Treatment consisted only of general supportive measures. She was symptom-free after the fourth day, and remained so until after the final lumbar puncture, when the headache and backache recurred. She asked to leave the hospital on the seventeenth day, and was dismissed, but returned two days later because of persisting headache. At this time there were no signs of meningeal irritation. The headache disappeared rather promptly after a short period of bed rest. During the course of the following year and a half she was seen several times, and had no further difficulty. Blood drawn five months after the onset of this illness was found at the National Institute of Health to contain no antibodies against the virus of lymphocytic choriomeningitis.

*Case 10.*†—H. C., a nineteen-month-old child, was brought to the hospital on November 2, 1938, with symptoms dating back four weeks. At that time he had injured his head in a fall. He soon became restless and irritable, vomited, lost weight, had stiffness of the neck and an elevated temperature. These symptoms varied in some degree but persisted until admission to the hospital. The physician who cared for

†This case is presented through the courtesy of Dr. Irvine McQuarrie, Professor and Head of the Department of Pediatrics.



him had diagnosed meningitis. For about two weeks before he was hospitalized he complained of bilateral earache, but there was no otorrhea. During this period it was noticed that there was impairment of hearing. He appeared to have some gait difficulty. His birth and early development were normal. His past health was good except for impetigo five months previously and a draining left ear three months before. No exposure to any infectious disease was reported. The family history was essentially negative.

When the patient was admitted, his temperature, pulse, and respirations were normal. There was a mucopurulent discharge in both nostrils. The cochleo-palpebral response could not be elicited, suggesting an absence of useful hearing. The eardrums were normal, as was the throat. The neck was stiff. Brudzinski's sign was questionably positive. Kernig's reaction was negative. Except for moderate emaciation, the examination of body systems showed nothing noteworthy.

The urinalysis was negative. The white blood count was 5,900 with 56 per cent lymphocytes. The hemoglobin was 62 per cent. Cerebrospinal fluid obtained on lumbar puncture contained 1,100 cells per cu. mm., with 73 per cent being lymphocytes; the protein was 149 mg. per 100 c.c., and the chlorides 664 mg. per 100 c.c. The spinal fluid was sterile on culture, and no bacteria were seen on direct examination. The serologic studies of the blood and spinal fluid were negative. Agglutination tests of the blood were negative for typhoid, paratyphoid, melitensis, tularemia, dysentery (Shiga), but positive in a dilution of 1:320 for dysentery (Flexner) on one occasion. The latter finding was of indefinite significance in view of the fact that there was no other clinical evidence of dysentery. Radiographs of the skull, mastoids, paranasal sinuses and long bones revealed nothing significant.

On the second day of his hospital residence his temperature rose to 103° F., and there were occasional elevations to above 101° F. for a period of two weeks, but most of this time he had no fever. For several days he was restless and fretful, showing no desire to eat. The signs of meningeal irritation disappeared in about a week. The nasal discharge persisted longer and the hearing defect did not improve. Therapy was limited to the ordinary supportive measures. Ten days after admission the spinal fluid contained 169 cells per cu. mm., 97 per cent of which were mononuclears. The protein value was high and the sugar was low in these specimens. Two weeks after entrance there were 68 cells per cu. mm. in the spinal fluid, 94 per cent being mononuclears. During the third week the pleocytosis had decreased to 23 white cells and all of these were mononuclears; the protein had become normal. The sugar continued to be slightly low, while the chlorides remained normal. No microorganisms were found in the smears or on the culture of the spinal fluid. The blood leukocyte count stayed within normal limits. The patient appeared quite well at the time of

his dismissal three and one-half weeks following admission, and was neurologically negative.

### Summary

1. Lymphocytic meningitis is presented as a clinical syndrome characterized by symptoms of meningeal irritation and lymphocytosis in the spinal fluid. The duration is usually brief (several days or a few weeks); complications are typically absent.

2. Ten cases of the condition are reported.

3. The blood serum of one case contained neutralizing antibodies against the virus of lymphocytic choriomeningitis. This case is of special interest in that it has run an active course for a year. It cannot be considered "benign."

4. The term *lymphocytic meningitis* is therefore suggested as a replacement for the term *benign lymphocytic meningitis* which is in common usage.

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## HISTORY OF MEDICINE IN MINNESOTA

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### HISTORY OF MEDICINE IN RAMSEY COUNTY

BY J. M. ARMSTRONG, M.D.

*(Continued from June issue)*

#### BIOGRAPHIES

The following short biographies of deceased physicians of Saint Paul supplements the information in the text of the History of Medicine in Ramsey County. The writer may be criticized for including notices of obscure and irregular practitioners, but an endeavor has been made to make the history as complete as possible to the year 1870.

##### **Rudolph Alberti**

Dr. Rudolph Alberti came to Saint Paul in 1855. Previous to that time he had been in Memphis as Emil Geist knew him there before he came to Saint Paul. According to Frank Werner he was a Pole and came from Krotichin near Posen. He claimed to have been a graduate of the University of Berlin. He was somewhat of a mystery even to the Germans in Saint Paul, and they could not quite fathom his domestic relations. He left Saint Paul and on his return had a woman with him and a child older than the number of years that had elapsed during his absence. He said the child was his. At one time he was in Dubuque and also in Winona and Chicago. He is described as being a heavy set man with dark hair which he wore rather long and pomaded with macassar oil. Dr. Wharton said he was a man of some ability, but rather shunned contact with the American physicians and was looked on with suspicion as to his qualifications. Nothing further seems to be known about him.

##### **William Baldwin**

Dr. William Baldwin came to Saint Paul in 1868, not with the idea of building up a practice but to better his enfeebled health. He was born at Washington, Mason County, Kentucky, March 4, 1813. He attended Ohio University at Athens, Ohio, and received his medical education under a preceptor, though he attended one course of lectures at the University of Pennsylvania, and possibly received his degree there in 1838. In 1854 he received an honorary degree of Doctor of Medicine from the Ohio Medical College at Cincinnati. He began the practice of medicine at Centreville, Alabama, in 1837 and in 1840 moved to Platte City, Missouri, where he became the president of the first medical society to be established in that county. He evidently was a man of some ability in his day. He died in Saint Paul, January 19, 1886. He was one of the founders of the Ramsey County Medical Society.

##### **William Banks**

Dr. William Banks came to Saint Paul in 1868. He is the only one of the original members of the Ramsey County Medical Society whose history we

have been unable to trace, nor do we know how long he remained in Saint Paul. He must have been a graduate in medicine or he would not have been admitted to the Society. We do find, however, that a William Banks graduated from Jefferson Medical College in 1848, but we can only conjecture that he was our William Banks.

#### **Percival Barton**

Dr. Percival Barton was born at Anson, Maine, November 16, 1822, and died on his farm at Inver Grove, Dakota County, Minnesota, February 21, 1914. In 1846 he read medicine with Dr. M. C. Richardson of Hallowell, Maine, and in the same year attended Dartmouth Medical School, and then had Dr. Isaac Palmer of Anson, Maine, as his preceptor. He returned to Dartmouth where he became assistant to the Professor of Anatomy, and for a short time practiced with Dr. John Hubbard. He then attended the Medical Department of the University of Pennsylvania, where he graduated in April, 1849.

Doctor Barton practiced medicine in New Portland, Kingfield and Vassellboro, Maine, till he came to Saint Paul in 1854 where he remained but a few weeks before going to Inver Grove. He was Assistant Surgeon, Seventh Minnesota Volunteer Infantry, and on April 20, 1865 was put in charge of the Freedmen's Hospital at Selma, Alabama. After his discharge from the Army he returned to Inver Grove. For several years prior to his death he was the oldest living graduate of the Medical Department of the University of Pennsylvania.

Medically he was a generation or two behind the times, being an anti-vaccinationist and anti-everything modern in medicine. In 1898 he published a small book of sixty-nine pages, "Common Sense for Common People versus Microbes and Official Tyranny." It was directed largely against the State Board of Health. Mr. J. C. Bryant, at that time principal of the High School, had the temerity to write a commendatory preface to it. Since Barton was the only physician residing in Inver Grove, the Town Board made him Health Officer there. This position enabled him to cause no end of trouble to the State Board of Health. He lived to be over ninety years of age.

#### **Charles Hodge Boardman**

Dr. Charles H. Boardman came to Saint Paul in 1868. He was a graduate of Yale College in 1859 and received his medical degree at the University of Pennsylvania in 1862. With the exception of the time spent in the Army as Assistant Surgeon, he practiced medicine in Philadelphia previous to his coming to Saint Paul. At one time he was surgeon to the Northern Pacific Railway Company, and lectured on medical jurisprudence at the University of Minnesota from 1887 to 1890. He was president of the Ramsey County Medical Society in 1876 and recording secretary of the Minnesota State Medical Society in 1877.

Doctor Boardman was well versed in the classics and his knowledge of the medicine of antiquity was profound. His graduating thesis at the University of Pennsylvania "De Novo Anæsthetico" was probably one of the last in Latin. He was born May 25, 1838, and died in Brooklyn, New York, July 17, 1907. He left Saint Paul about 1890. He was one of the original members of the Ramsey County Medical Society.

#### **E. E. Braun**

Dr. E. E. Braun, a French-Canadian, came to Saint Paul from Charlestown, Massachusetts, in 1859. In 1861 he took service in the Army and was Post

## HISTORY OF MEDICINE IN MINNESOTA

Surgeon at Forts Abercrombie, Wadsworth, Ridgely, and Ripley. He was born at Quebec, June 11, 1821, and educated at Nicollet College, Three Rivers, Canada. In 1868 he settled at Little Falls, Minnesota, where he died October 14, 1870.

In the year 1866 Doctor Braun discovered a small tumor on the inner side of his right thigh, equidistant between the hip and knee. This tumor progressively enlarged and in November, 1869, caused him to be confined to his bed. Ulceration occurred in July, 1870. At the time of his death shortly after this date, the tumor weighed fifty-seven pounds. The State Medical Society appointed a committee to determine the nature of this tumor. It was examined by Dr. Harry C. Hand who reported it to be a colloid spindle-celled sarcoma.

### Albert G. Brisbine

A native of New Lisbon (now Lisbon), Ohio, Dr. Albert G. Brisbine was born in 1825. He was a graduate of Jefferson Medical College and came to Saint Paul in 1851. He was present when the writer was born and cared for him during his childhood. I remember when he came to see me when I sustained a Colles fracture and watching him as he whittled out a splint from a shingle, being somewhat in doubt as to where the shingle was to be applied. He was regarded by his later contemporaries as somewhat out of date. He lived for many years on Pleasant Avenue, where the Peoples Church now stands, in a house well set back from the street with many rose bushes in the yard. Our family set great store by a cough medicine of his, later known to the druggists here as Canada Balsam Compound, which tasted very much worse than it sounds. Long after his death that prescription was filled many times at Carl Simon's Drug Store on Third and Market Streets.

Dr. Brisbine was one of the founders of the Minnesota State and Ramsey County Societies. His office for many years was on the river side of Third Street just east of Washington Street. When the late Dr. E. J. Abbott came to Saint Paul, he went into Doctor Brisbine's office, and Dr. Clinton C. Miller was also at one time associated with him.

Dr. Brisbine died as the result of an accident on June 3, 1887. He stooped to pick a flower from the edge of the bluff, along the present River Boulevard, lost his balance and fell over, rupturing his liver, and died a few days later. He was a very large man and must have weighed nearly three hundred pounds.

### David Day

Dr. David Day was born in Burkes Garden, Virginia, on September 19, 1825. He came west to Wisconsin and engaged in lead mining, studying medicine evenings and in his leisure hours, and attended the University of Pennsylvania in the winters when he could. He came to Saint Paul in 1849 on the advice of his brother, Dr. J. H. Day, then practicing in Stillwater. On his way to Saint Paul he contracted the measles and was obliged to stop over at Prairie du Chien on that account. He nearly died of the disease and tuberculosis set in. Finally, when he arrived in Saint Paul in May, one lung was completely hepatized and he was so weak he had to be carried up the hill from the landing. Shortly after his arrival, Minnesota Territory and Ramsey County were organized, and Governor Ramsey appointed him Register of Deeds for the county. In 1850 he was elected to that office for the succeeding two years.

In 1852 because of his health Doctor Day wished to be out in the pine woods, so Governor Ramsey secured for him the position of physician to the



Winnebago Indians, then at Long Prairie, where he remained till the spring of 1854, putting in a very profitable two years studying and with great improvement of his health. He also put aside sufficient money to start himself in the drug business on his return to Saint Paul. While at Long Prairie he was elected to the Legislature of 1852 and 1853. This last year he was elected Speaker of the House by one vote on the sixty-fifth ballot after twenty-two days of voting. After his return to Saint Paul he gradually gave up practice and turned his entire attention to the drug business (Day and Jenks) both wholesale and retail. His place of business was on Third and Cedar Streets. He retired from business in 1866. He was State Prison Inspector in 1871, Wheat Commissioner in 1874, and Postmaster of Saint Paul from 1875 to 1888.

Doctor Day was a large man and wore a full beard and mustache, both of which were white as the writer remembers him. He was among the first to advocate a medical practice act and at the first meeting of the present State Medical Association (February 1, 1869) introduced a resolution that a committee be appointed to confer with the Legislature on the subject. He was one of the founders of the Ramsey County Society. He died in Saint Paul, March 8, 1896.

#### John Harvey Day

Dr. John Harvey Day was born in Virginia, April 20, 1816. He came to Minnesota, or Wisconsin Territory as it then was, in 1847 about two years before his brother, Dr. David Day; it was on Dr. J. H. Day's suggestion that David came to Saint Paul. He first settled in Stillwater having practiced at Prairie du Chien before that time. He, with Doctor Carli of Stillwater, were the two physicians out of the sixty-one signers of the memorial addressed to President Pierce asking for the organization of the Territory. He was known to the early settlers as the "old doctor" in distinction to David Day who was the "young doctor." In 1854 he was elected from Saint Paul to the Fifth Territorial Legislature. He left Saint Paul the same year and went to Leavenworth, Kansas. After remaining there some time he went to Walla Walla, Washington, where he died in 1897. He and Dr. David Day looked very much alike and dressed alike; they were both large handsome men. Dr. J. H., however, had blue eyes while Dr. David had brown eyes. He was ten years David's senior in age.

In the early days in Saint Paul, French was spoken as commonly as English, and as neither of the Days spoke French, Mrs. Fuller (formerly Mrs. Samuel Willey) then a young girl, was often asked to act as interpreter for them. Her only playmates at that time were the French half-breed children of Scott Campbell. Dr. John H. Day's name will not be found in the list of graduates of the University of Pennsylvania because apparently he changed his first name from Jeremiah to John. He graduated under the name of Jeremiah H. Day in 1850.

#### William W. Finch

As stated in the text there was reason to believe that William W. Finch was some place in Minnesota after leaving Saint Paul. The following is abstracted from a History of Steele and Waseca Counties (Chicago 1887):

"On the 9th of October, 1861, Dr. W. W. Finch was elected county treasurer and served two years. Dr. Finch was originally from Vermont. He came west at an early day and settled in Clinton Falls, where he engaged in farming. He had been a practicing physician

## HISTORY OF MEDICINE IN MINNESOTA

before coming to Steele County, and during his entire residence here he attended calls and took care of a practice which his neighbors forced upon him. He remained in the county for a number of years after the expiration of his term of office as treasurer, and finally removed to Santa Barbara, Cal., where he died. He had accumulated a comfortable fortune before leaving Steele County. Dr. Finch was a man of a good deal of both natural and acquired ability; a man who was esteemed and respected, and justly, by all who knew him."

There is no record that he ever took out a license to practice medicine in California, nor do the records of the California Board of Health extend far enough back to record the date of his death.

### **Samuel D. Flagg**

Dr. Samuel D. Flagg was born in Buffalo, New York, August 7, 1838. He received his medical degree from Jefferson Medical College in 1859, and shortly after graduation obtained an appointment in the Medical Department of the United States Navy. In 1865 he was retired from the Navy for disability because of pulmonary tuberculosis. He came to Saint Paul for his health. It was thought by his friends as well as by himself that recovery was impossible. He arrived about the first of 1866, and almost immediately, owing to his interest in mental diseases, was appointed on the commission to organize the State Insane Hospital.

In 1868 Doctor Flagg brought to Saint Paul and perhaps to Minnesota the first clinical thermometer. Drs. D. W. and H. C. Hand were very much interested in the instrument. Dr. H. C. Hand was familiar with the use of the thermometer.\* In 1869 Doctor Flagg performed the first operation for the extraction of cataract in Minnesota. Operations on both eyes of this patient were successful. He told the writer that he was well punished for doing a successful operation, as the old lady at every opportunity thereafter insisted on reading the Bible to him to prove the success of the operation. He never operated for cataract again.

Doctor Flagg was a tall cadaverous looking man, very precise and dignified in his manner, and a great money-maker. He died December 25, 1926, at the age of eighty-eight years. Until five years preceding his death he regularly attended his office and only gave up work when his eyesight failed.

\*See an article published in the *Northwestern Medical and Surgical Journal*, Saint Paul, on temperature following childbirth.

### **Otis Everette French**

Dr. Otis French, son of John French and Mary Richardson French of Boston, was born March 1, 1818. He was educated at Wells Seminary, Jamaica Plains, and at Yale College. He received his medical degree from Harvard in 1841. He practiced medicine in various places: Boston, Philadelphia, Iowa, Minnesota, Illinois, Ohio; Garnett, Kansas; and Denver, Colorado. During the Civil War he was Surgeon of the 114th Regiment, Ohio Volunteers, and was the author of a small manual "The Art of Midwifery." He died in California in 1884.

*(To be continued in August issue.)*

## President's Letter

**A**MONG the important reports presented to the House of Delegates at the Minneapolis session was a significant account of relations between the practicing profession in Minnesota and the University of Minnesota.

Close contact and a complete understanding of the functions and interdependence of each, are necessary for the successful functioning of the medical school as well as the profession. Our Committee on University Relations, now under the chairmanship of Past President J. M. Hayes of Minneapolis, works closely with Dean H. S. Diehl of Medical Sciences, Dr. Ruth E. Boynton, Director of the Student Health Service, and Mr. Ray Amberg, Superintendent of the University Hospital, toward this end.

Our gratitude is due this group of University officials for their sincere efforts to maintain the University Hospital as a teaching hospital, exclusively, and to avoid, as far as possible, any infringement upon the private practice of medicine. Occasional complaints concerning the coöperation of hospital staff with referring physicians have been carefully and conscientiously heard and every effort has been made to correct the situation.

As a result of efforts by both the University Relations Committee and the Committee on Medical Economics, a new, compulsory senior course on medical ethics, medical organization and the economic and social relation of the young physician embarking upon practice, has been inaugurated this year. The value of this course as it was outlined in the Medical Economics section of the June MINNESOTA MEDICINE is beyond question. Both students and the officials of organized medicine in the state are deeply indebted to Dean Diehl.

We are indebted, also, to Dr. W. A. O'Brien and the Center for Continuation Study for excellently planned postgraduate courses which bring our members to the University campus in special groups for a week of intensive postgraduate study, following a pattern that is unique in the entire country for this type of study.

Our University Medical School is outstanding among the distinguished medical schools of the country and we are fortunate in Minnesota to have this new opportunity of keeping in close touch with its teaching and research.

GEORGE EARL, M.D., *President,*  
Minnesota State Medical Association.

## EDITORIAL

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#### BUSINESS MANAGER

J. R. BRUCE

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Volume 22 JULY, 1939 Number 7

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### DR. CHARLES H. MAYO

JUST before our annual meeting the sad news  
of the death of Dr. Charles H. Mayo on  
May 26 reached the members. The passing of  
such a distinguished member of the profession  
deserves more than the usual mention. If his-  
tory is a record of the lives of great men, another  
milestone in medical history has just been passed.

The professional activities as well as the life  
of Dr. Charlie were always closely linked to  
those of his older brother, Dr. Will. The two  
have had a common objective and, what is most  
unusual, a common purse. As Dr. Charles once  
said, "My one great ambition is to relieve all the

physical suffering possible during my life." The  
expansion of the Mayo Clinic not only to serve  
thousands of the sick, but as an educational cen-  
ter, attained this objective in a large way.

To take stock of the life of Dr. Charles H.  
Mayo is to review the growth of the Mayo  
Clinic. Dr. Charlie got his start in his medical  
career when as a boy of twelve he was called  
upon in an emergency to administer chloroform  
for his father. He began practice with his father  
and older brother in the early eighties. The build-  
ing of the first Saint Mary's Hospital was ac-  
complished in 1883 by the Catholic Sisters after  
the need of a hospital was demonstrated that  
year by the visit of a tornado to Rochester. The  
formation of a group called the Mayo Clinic,  
the opening of the first clinic building in 1914  
and the newer building in 1928 to care for the  
thousands who visited the medical center each  
year, all followed in succession. Also should be  
mentioned the establishment of the Mayo Foun-  
dation, in 1915, in affiliation with the University  
of Minnesota Medical School to incorporate the  
educational activities of this center, and the  
establishment, in 1919, of the Mayo Properties  
Association for the holding of all property, en-  
dowments and funds of the Mayo Clinic to in-  
sure the permanence of the institution for public  
service.

Dr. Charlie had more than a spark of genius.  
Specializing in the early days in surgery of the  
head and neck, he made use of his mechanical  
ingenuity in his surgical work at a period when  
surgeons were more self made than at present.  
His scientific interests were not limited to the  
medical field. From an early age he took a  
great interest in scientific farming, to which his  
country home, Maywood, attests. His scientific  
attainments were such that universities honored  
themselves in bestowing honorary degrees upon  
him.

Friends and acquaintances found Dr. Charlie  
a man of many interests and an entertaining  
speaker. Unostentatious and easily approached,  
he was also a warm-hearted humanitarian and  
gave freely of his time and energies to public  
activities, such as the Minnesota Public Health



Association, the Boy Scout organization and the local health department, which he served without compensation for many years. His was a particularly full life and Minnesota has lost one of its leading citizens.

### PURPOSES AND POLICIES OF THE UNIVERSITY HOSPITALS

THE main purpose of the University Hospitals is to train physicians for general practice, to train specialists in their fields and also auxiliary medical assistants so that all of them may in turn serve the communities of the state.

This purpose needs to be re-stated and re-emphasized especially to county commissioners and welfare boards throughout the state, in order to protect the standing of the hospital as a teaching institution and to prevent it from being overburdened with relief work.

Along with its teaching, the hospital is indeed able to help solve the problem of the indigent patient. But it should be well understood by county authorities that the University Hospital is not a relief agency. It is only a partial source of hospitalization for the needy of the state and county authorities should make disposition of their patients in their own communities as far as possible using their home facilities and their home doctor and hospital.

The University Hospitals unit is the chief clinical teaching source for the Medical School of the University. In all it has 500 beds including bassinets. Last year the hospital admitted 9,216 in the In-Patient Department, which was an increase of a few from 9,186 admitted the previous year. The total number of hospital days was 132,262 and the average length of stay of patients was 14.1 days. The daily average number of patients was 362 which gave the hospital an average occupancy of 72.4 per cent. The Out-Patient Department visits aggregated 96,082.

The services in the hospital are divided as follows: Neurology, Medicine, Surgery, Ear, Eye, Nose and Throat, Obstetrics, Gynecology, Pediatrics, Psychiatry, and Ambulatory. This distribution is arranged chiefly to satisfy the teaching needs. The administration has attempted to hospitalize a representative group of patients that will be valuable from a teaching standpoint to which the service is incidental. In order to

teach by example properly we have attempted to make this a good hospital and one which would be satisfactory to the doctors and agencies who are referring us patients.

At present there are so many on the waiting list, that the average patient's application requires several months before he is admitted for care. All patients are admitted through a central admitting department from which they are selected for teaching purposes and for the emergency treatment sometimes required because of the acuteness of their illness. Patients are admitted on recommendation of their own physician and certification of their county welfare secretary or commissioner. The hospitals conduct its own investigation service and reserves the right to reject any patient not considered financially or otherwise eligible.

Because of teaching and research, we are especially interested in certain types of cases and illnesses. The usual procedure in the selection of cases is to have the senior fellow on the service go over the application list and make the selection for his service. This sometimes works a hardship on the patient, because we are usually loaded with applications for repair of hernias, urological conditions, and chronic surgery such as orthopedics, which we can never hope to take care of. For these cases especially, arrangements should be made with the local physician and hospital.

RAY M. AMBERG, *Superintendent*  
University Hospitals.

### THE DIAGNOSIS OF TUBERCULOSIS

RECENTLY there has been considerable discussion of the comparative place of the various procedures in use, in the diagnosis of tuberculosis.

In a timely and comprehensive article appearing in the May 13 issue of the *Journal of the American Medical Association*, Dr. J. Arthur Myers, Professor of Preventive Medicine, University of Minnesota, discusses three methods commonly used in determining the presence of infection: the pathological examination, the tuberculin test and the x-ray in the light of present-day evidence.

The pathological examination is described as a highly secure method of detecting the presence of tuberculous infection, but one with a

serious handicap in the fact that the majority of infections are located so far from the surface that they are not available for ante-mortem examination.

Dr. Myers presents evidence to prove that the tuberculin test determines with a high degree of accuracy the presence or absence of living germs in the body. He shows its value not only in selecting among children future potential cases, but also in leading to the source of infection. The importance of using an accepted tuberculin, of the proper technic in administering it, and of the proper interpretation is emphasized in the article. The point is made that while the test is not infallible, when it is properly administered and the individual does not react, there are, with rare exceptions, no living tubercle bacilli in the body.

The physical limitations of the x-ray such as the fact that it is usually limited to the chest and to a single film of the chest in which a considerable part of the lung is obscured from view by the shadows of the heart, diaphragm, etc., are stressed. Evidence is presented showing that the x-ray examination is effective in finding only from 20 to 25 per cent of the lesions of primary tuberculous infection.

In his conclusion, Dr. Myers makes a point it is well for all to remember. There is no short cut to the diagnosis of tuberculosis. Before a final diagnosis is made all procedures should be utilized and every bit of evidence carefully assembled and analyzed.

E. A. M.

#### THE MINNESOTA PROGRAM FOR CARE OF THE PREMATURE INFANT

THE Division of Child Hygiene, Minnesota Department of Health, in coöperation with the Minnesota State Medical Association and the Minnesota Hospital Association, has planned a program for improvement in the care of premature infants in Minnesota. This plan contemplates the sending of a specially trained pediatric nurse to the hospitals of the state, in rotation, to introduce the newer ideas and methods for care of the premature baby. The program is, then, in the nature of postgraduate education for those in our hospitals actually engaged in the care of the newborn.

The nurse selected for this work, Miss Ger-

trude Carlsrud, R.N., has a fine background of several years' experience as pediatric nursing supervisor at the University of Minnesota Hospitals. She has recently completed a period of training in the care of the premature infant under Dr. Julius H. Hess at the Sarah Morris Hospital Premature Station, Chicago, and is now engaged in the work of this new program in Minnesota.

The justification for this project lies, first, in the relative importance of prematurity as a cause of infant mortality and, second, in the demonstrated preventability of many of the deaths due to this cause. While infant mortality in Minnesota has shown a steady decline for many years and has reached the exceedingly low rate of 38.7 deaths per 1,000 live births in 1938, this decline has occurred largely because of the reduction of deaths among infants aged two months to one year. In the newborn period, however, there has been considerably less change and the causes for these early deaths are found to be prematurity, congenital malformations, birth injuries and diseases peculiar to early infancy. Of these, prematurity is by far the most prominent. A recent tabulation of the causes of infant deaths during the first month of life for the triennial period 1936-38, prepared by the Division of Birth and Death Records and Vital Statistics of the Minnesota Department of Health, showed that premature birth was reported as being responsible for over 53 per cent.

Dr. Julius H. Hess is primarily responsible for the demonstration of the preventability of deaths among prematurely born infants. In his work at the Sarah Morris Hospital Premature Station, Chicago, he has developed a system of nursing care for premature infants which has been very successful in reducing the premature death rate. This work has been repeated in several other places and notable among these is the work at the Minneapolis General Hospital under the direction of Dr. A. V. Stoesser. The deaths of premature infants in this hospital have been reduced from approximately 60 per cent in 1930-31 to 13 per cent in 1936-37.

Minnesota has long been a leader among the states in the reduction of infant mortality. It is significant, then, that so large a proportion of our present rate is due to prematurity. The successful operation of this program offers the

hope of a further substantial reduction in the infant mortality rate for Minnesota.

A. J. CHESLEY, M.D.

Secretary and Executive Officer  
Minnesota Department of Health

### PNEUMONIA SERUM DISTRIBUTION

THE State Board of Health met with the Councilors June 1, 1939, in executive session for discussion of Public Health activities and policies, the Council acting in advisory capacity to the State Board. Dr. Owen W. Parker, President, Dr. O. O. Larsen, Vice President, and several members of the Board of Directors of the Minnesota State Sanitary Conference called a luncheon session which was attended by forty medical health officers from different parts of the state on June 2, 1939, for a similar discussion. Surgeon C. R. Coffey of the United States Public Health Service, representing the Surgeon General, attended both of these sessions.

The most important decision relates to the pneumonia program of the State Board of Health.

The Legislature was unable to grant the Board's request for additional funds for the pneumonia program, one item of which was \$20,000 per annum for pneumonia serum. The item in the Board's budget "Providing Free Antitoxin and Other Biologics and Chemiotherapy for Communicable Disease" is the only one that was not reduced for the present biennium and this was due to the efficiency and unremitting effort of Dr. L. L. Sogge, Chairman of the Legislative Committee of the State Medical Association and also of the State Sanitary Conference, and Mr. F. Manley Brist, who spent the night at the end of the session with the conferees who set the amounts for State Department appropriations which were agreed to by the Legislature and included in the Appropriations Act for the biennium beginning July 1, 1939.

Unless some emergency should arise, such as a diphtheria outbreak, the Board expects to be able to use some of the biologics fund for the purchase of pneumonia serum and if the Surgeon General approves its request will have several thousand dollars additional available for serum. But the experience to date in the distribution of the serum and expectations as shown by the increase in the typing service and the resulting need for serum shows that it will be ab-

solutely necessary to limit the serum provided to Types I and II as long as the available funds last. And it was definitely decided that free serum for pneumonia patients should be restricted to those who were unable to pay for serum. The Board in coöperation with the Medical Association officers will endeavor to secure a definite policy through the State Relief Agency providing for county welfare boards to bear the cost of serum and report on this subject will be issued in the journal later.

The Division of Preventable Disease in its Main Laboratories began pneumococcus typing and distribution of therapeutic serum through the aid of federal funds supplied by the Public Health Service in January, 1937. The work grew rapidly due to a real need for this service throughout the state. Experience soon proved that typing could be carried out on sputum sent to the Main Laboratories from the most distant points and therapeutic serum could be supplied within ninety-six hours of first symptoms. A twenty-four hour laboratory service has been maintained. The growth of the service is indicated by the following:

	Specimens Submitted for Typing	Persons Serum Distributed	San. Dist.	Counties
1937	664	128	73	39
1938	2,025	583	392	75
1939 to June 1, 641	692	692	304	76

The State Medical Association "Public Health package" carried material in January on pneumonia, so the physicians of the state are quite familiar with the situation and the public has been advised by the physicians and through the use of the moving picture "A New Day." The members of the Legislature were sympathetic and interested in the program, realizing the need of the service and the large number of deaths from pneumonia that occur annually in the state, but felt that the financial conditions were such that the Board's request for additional funds for the pneumonia program could not be granted. Therefore, the coöperation of all physicians with the State Board of Health is earnestly requested to make the serum which can be provided with the limited funds do the most good. The typing service will be continued without curtailment on a twenty-four hour basis.

The Board will have difficulty in carrying its present services with the reduced appropriations

## MISCELLANEOUS

for the biennium. If reduction in any service becomes necessary due notice will be given to the physicians of the state.

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## MISCELLANEOUS

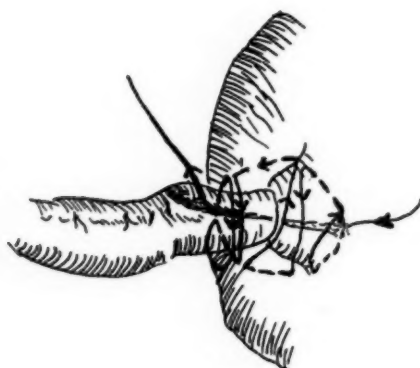
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### A DOUBLE-INVAGINATING PURSE-STRING SUTURE

FRANCIS E. KIBLER, M.D.

*Austin, Minnesota*

FOR the past two years the author has used this particular type of purse-string suture to the exclusion of all others, and has avoided the difficulties and complications frequently attributed to the usual simple purse-string suture.



The method was first demonstrated by the late Dr. Van Meter, of Denver, Colorado. No description of this technic has, to my knowledge, ever appeared in any surgical textbook or journal.

As far as can be determined, this procedure is a modification and definite improvement of the Fabrique method.

The advantages of this suture technic over both the circular and Fabrique methods are two-fold: (1) a double-invagination of the stump is possible without assistance, and it obviates the necessity of placing a second purse-string for those who are so inclined; (2) a smaller area of bowel is incorporated in the suture line, thus lessening the possibility of ischemic necrosis of the bowel wall with its serious and embarrassing consequences. All this is done quickly, no extra bites are necessary in the bowel wall, and the distortion is no greater than that produced by the simple circular suture, and the double security offered is evident.

This purse-string is begun by taking a small bite

into the serosa and muscular coat of the cecum 0.5 to 1 centimeter from the base of the appendix (just as in starting the usual type). The suture, however, is reversed and the second bite is taken adjacent to the first but across the mid-line, and directed up the opposite half of the circle. Each succeeding stitch is reversed across the mid-line and taken in the wall opposite the preceding one, until the two half-circles meet opposite the original starting point. This amounts to a circular placement of the Cushing intestinal suture.

The ligated appendix is then amputated at the neck, the stump carbolized and buried by the simple expedient of pulling on the opposing suture ends, which are then tied, and the primary suture line is itself invaginated.

The primary invagination may be aided by a forcep on the appendiceal stump.

The accompanying drawing illustrates this suture technic. Arrows indicate the direction of the suture, the dotted lines indicating the subserosal portion, while the solid line represents the loops.

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## OF GENERAL INTEREST

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Dr. Wm. McLane, formerly of Jackson, Minnesota, has moved to Perham, where he has begun the practice of medicine.

\* \* \*

Dr. C. B. Will has recently established offices at Bertha, where he will be associated in practice with his uncle, Dr. W. W. Will.

\* \* \*

Dr. R. W. Merrill, a graduate of the University of Minnesota, recently became associated with Dr. John F. Cumming at Morris and Chokio.

\* \* \*

Dr. Robert Schmidt of Glencoe, University of Minnesota, 1939, and Dr. Ira Wilson of Rochester, University of Minnesota, 1934, joined the staff of the Worthington Clinic Hospital, Worthington, Minnesota, July 1. The staff now numbers six physicians.

\* \* \*

Dr. J. C. Rothenburg of Springfield completed fifty-four years of active practice the week of June 15. He is planning to retire in the near future.

\* \* \*

Dr. Horace Newhart was elected president of the American Otological Society at its seventy-second annual meeting at Westchester Country Club in Rye, New York. This is the oldest society of its kind in the world.

MINNESOTA MEDICINE



# MEDICAL ECONOMICS

Edited by the Committee on Medical Economics  
of the

Minnesota State Medical Association

W. F. Braasch, M.D., Chairman

## ACTION BY THE DELEGATES

From the point of view of national policy the most important action taken by the House of Delegates in session at Minneapolis was its endorsement of the opposition of the American Medical Association to the Wagner Health Bill.

Coming in the midst of hearings before the Senate committee in Washington this endorsement had an especial weight and significance.

The resolution was drawn up by the Hennepin County Medical Society, approved by the Council and passed without a dissenting vote by the delegates. It reads as follows:

WHEREAS, there is now pending in Congress a measure known as the Wagner bill (S. 1620), entitled the National Health Act of 1939, which contains many provisions which we believe are unwise and unworkable either from a public health or an economic standpoint; and

WHEREAS, the bill makes no provision for use of existing unused hospital and treatment facilities; and

WHEREAS, the bill obviously leads by indirection to compulsory health insurance, to which the medical profession is definitely opposed; and

WHEREAS, the House of Delegates of the American Medical Association in its recent session held in St. Louis, while affirming its continued willingness to cooperate with all government agencies in the legitimate handling of public health problems, took a definite stand in opposition to the Wagner bill in its present form; therefore be it

RESOLVED, by the Minnesota State Medical Association that S. 1620 will not promote the public interest in economics or health; and be it further

RESOLVED, that we endorse the action of the American Medical Association in its opposition to S. 1620; and be it further

RESOLVED, that our Senators and Representatives in Congress be apprised of this action and requested to use all possible efforts to secure such modification of S. 1620 as will bring it into conformity with the principles adopted by the American Medical Association and the Minnesota State Medical Association, or, failing in that, to oppose its passage.

## Program and Policies

Proceedings of the House of Delegates will be printed in full in an early issue of MINNESOTA MEDICINE. The following high lights are presented in order to give a general picture of the work of the Minnesota State Medical Association, its policies and future program.

A policy of "watchful waiting" on the question of sickness insurance was adopted upon recommendation of the Committee on Medical Economics.

This policy is based on Minnesota's unique morbidity and mortality rates under our present system of close coöperation with official agencies and on a careful study of information received from doctors, hospitals, nurses, welfare boards and school heads from all over the state, gathered in the course of the statewide Survey of Need and Supply of Medical Facilities just completed by the committee.

## Present Methods of Practice Require No Radical Change

"In the main, the doctors, institutions and lay groups who reported to us in the recent statewide survey of medical care are satisfied with our present methods of distribution of medical care," Dr. W. F. Braasch of Rochester, chairman of the committee, reported to the delegates.

"Some plan for adjustment of professional fees where such adjustment is needed, together with hospital insurance, would seem to go a considerable way toward solving the problem of medical costs for most people.

"In view of the fact, however, that many of these plans, and also straight health insurance plans which are being tried out in a number of other states, are still in the experimental state, it seems wise for us in Minnesota to see how they work out before promoting any of them," he declared. "In Minnesota, with our low morbidity and mortality records, we can well afford to remain for the time being in the rôle of observers." (A résumé of the results of the Survey as printed in the May issue of MINNESOTA MEDICINE was distributed to the delegates.)

### No Need for Haste

Representatives of the Farm Security Administration have several times appeared before the Council and the Sub-Committee on Low Income and Indigent Problems requesting establishment of some form of medical cooperative by which Farm Security Clients might secure medical care on a pre-payment basis, according to Dr. W. A. Coventry of Duluth, chairman of the committee. The committee has studied the situation in Minnesota and also reports of plans in operation in other states. In Minnesota, there is a total of 7,286 farmers under jurisdiction of the Farm Security Administration. Of this total, 1,350 are in the territory of the Upper Mississippi Medical Society, which includes sparsely settled regions with considerable inferior farming country, 659 are in the East Central Society, and 720 in the Red River Valley Medical Society. No requests have come from any of these farmers themselves nor from officials or physicians from the communities affected. It is the feeling of the committee, therefore, that no plans should be hastily formulated or pushed. The needs of these people are being met at the present time by the regularly constituted agencies and new plans can be formulated when these agencies are shown to be unable to carry the load.

### Free Choice Guaranteed

Dr. B. B. Souster, St. Paul, secretary of the association, reported that the position of the physician in the administration of relief and social security aids is now well established in Minnesota.

The relief law, which for two years has guaranteed to relief clients their "choice of vendor," was further clarified at the last session to specify that this choice applies to services as well as to supplies, thus ending all controversy as to whether the choice of vendor clause applies to physicians' services, Dr. Souster declared. With the exception of the larger cities where free outpatient clinics have been established for many years, the needy now have their choice of physician in every county in the state where state aid is accepted.

### Private Medicine Intrenched

"The system of private medicine working closely with official agencies in the handling of public charges is probably more firmly intrenched in this state than ever before," he said, "and the future policy of the

state medical association undoubtedly lies in the development of this system rather than in doubtful and expensive experimentation that may well operate, in the end, to disturb favorable record and lower standards of care in the state."

Appreciation was expressed by Dr. Souster for the close cooperation of the State Department of Health and the State Board of Control and the State Relief Administration.

An increase of 125 members, largest increase in the history of the organization, was reported for 1938 and 1939.

### Surplus

The good financial condition of the association was noted by the treasurer, Dr. W. H. Condit of Minneapolis. The year ended with a substantial surplus, Dr. Condit reported. The deficit of the year before was paid out of this surplus and the remainder was used to purchase bonds to be added to the permanent investment fund of the association, representing the first addition in many years made to this fund.

The most important organized activity carried on by the medical profession in Minnesota is public health education, according to the report presented by Dr. L. R. Critchfield.

### Public Understanding Necessary

He advocated expansion of the present educational program of the association, which now includes radio programs, a news service, college lectures and the new coordinated program by which every county medical society in the state lends assistance to the committee in an educational campaign on one subject each month. A share in Minnesota's low death and disease rates is credited in the report to the organized efforts of the doctors.

"Events in Washington and widespread lay discussion of medical care merely emphasize the need for a better public understanding of the fundamentals of health protection," according to the report. "It is generally agreed that a large section of the population undoubtedly stands in need of medical care but is not sufficiently instructed to secure such care. For these people, vast new facilities contemplated in the Wagner Health bill will be of no use. What they need is education, and it should be the personal obligation of every physician to aid in extending it."

Personal instruction of patients and organization in their own communities was urged upon association members.

## Removing Cancer Fear

To remove public fear of cancer and to substitute for it an enlightened knowledge of how to control and cure malignant disease was defined as the current aim of the Committee on Cancer, of which Dr. Martin Nordland of Minneapolis is chairman.

To put this program into practice the committee worked closely with the Women's Field Army Against Cancer. It aided, also, in preparation of material for the state association's cancer education month in April and provided speakers for meetings on the subject throughout the state. Every physician was urged by Dr. Nordland as chairman to assist the Field Army in its campaign.

## Fracture Program

Improvement on a statewide scale in the handling of fractures is the objective for next year of the Committee on Fractures, of which Dr. F. J. Elias is chairman.

The first step was the organization of fracture committees in each county medical society which was initiated at the fracture dinner held Wednesday night, May 31, in Minneapolis, with Dr. Charles L. Scudder of Boston as speaker. These committees are to have a two-fold function as reported by Dr. Elias: to keep their respective societies up to date on any new developments in the medical and surgical repair of fractures and to supervise closely the handling of first aid for fracture victims, particularly traffic fractures.

The extensive program on fractures which was a feature of the 86th Annual Meeting was sponsored by the committee.

## Finding Defective Children

Funds should be made available, if possible, for finding children in rural areas, particularly, who are hard of hearing; also for correcting their hearing defects, Dr. Horace Newhart of Minneapolis, chairman of the Committee on Deafness Prevention and Amelioration, declared in the course of his report to the delegates. In this connection, the following resolution was passed at his suggestion:

The Minnesota State Medical Association approves and recommends the granting of funds by the Foundations and other appropriate agencies for the encourage-

ment and administration of well coördinated programs for the early detection of visually and orally handicapped school children and those threatened with such handicaps and for the needed corrective medical care of indigent and under-privileged children so handicapped, such programs to be carried out by local and state agencies under guidance of specially qualified, regularly certified physicians.

A new audiometer for detecting hearing loss is now available at a moderate price, according to this report. By means of it the hearing of large numbers of children can be accurately checked in a minimum period of time. Purchase of this instrument is now possible for small communities.

## Postgraduate Courses in Venereal Disease

A series of one-day courses on control and treatment of venereal diseases will be given for doctors in all parts of the state next October, the Committee on Syphilis and Social Diseases, of which Dr. F. W. Lynch of St. Paul is chairman, reported to the delegates.

These courses will be sponsored by the committee, the University medical school and the State Department of Health. They are scheduled for next October to coincide with the campaign of public education on the same subject planned by the association for that month. Federal funds will be used to finance the lectures.

Minnesota has for many years had an effective program for the control of venereal disease, Dr. Lynch reported, and the number of new cases reported each year is lower than in many other states. No legislation for pre-marital Wassermann tests will be advocated by the committee for Minnesota; but if such legislative action should be proposed in the future from any other quarter the committee urges physicians to direct it along reasonable and practical lines.

A new and up-to-date edition of the booklet on diabetes which was published by the Committee on Diabetes several years ago will be undertaken this year, the committee announced to the delegates. The booklet will be available, as formerly, to any patient through his own physician.

## For Aviation Medicine

The Medical Reserve Corps lacks sufficient funds to train reserve officers in aviation medicine, according to the Committee on Military Affairs. Only one applicant in the Seventh

Corps Area received active duty training in aviation medicine last year and several others of the grades of captain and first lieutenant passed all requirements but were denied training because of lack of funds. A resolution was accordingly approved by the House of Delegates at the request of Dr. F. L. Smith of Rochester, chairman of the committee, asking Congress for sufficient funds for training one reserve officer for each reserve area in the United States and for each military department of the insular possessions in this important new branch of medicine.

There are now 675 Medical Department Reserves on active status in the Army and Navy, Dr. Smith reported, and 585 officers. There has been a decided increase in promotions of officers in the reserve during the past year.

#### Doctor Mayo

Among important resolutions passed by the delegates was the following on the death of Dr. C. H. Mayo:

WHEREAS death has removed from us Dr. Charles H. Mayo, a great humanitarian, a world-renowned surgeon, a beloved member and former president of our association and

WHEREAS Dr. Mayo and the great institution which he helped to establish has brought world recognition, greater scientific knowledge, greater opportunity for professional attainment and progress to every physician in Minnesota, and

WHEREAS Dr. Mayo had ever at heart the welfare and interests of this association, of his colleagues in Minnesota, and seldom failed to attend these annual sessions,

BE IT RESOLVED that in his passing the world has lost a great leader, and the doctors of Minnesota a friend, a teacher of high professional attainments and a distinguished exemplar of the lofty ideals of a great profession whose memory will ever remain with the members of this House and this association as an inspiration and guide.

A resolution of regret at his retirement from office and from active practice was also sent to Dr. J. T. Christison of St. Paul.

Resolutions of appreciation for their assistance and for their sympathetic coöperation were ordered to be sent to the State Board of Health and Dr. A. J. Chesley, executive officer, and to Dr. S. E. Gilkey, Medical Director of the State Relief Administration. A resolution was also passed petitioning for an immediate appropriation for a new building to House the Army Medical Library previously authorized by Congress.

#### RECENT PROGRESS OF THE WAGNER HEALTH BILL

Of outstanding importance to the future welfare of medicine is the stand taken by the House of Delegates relative to the Wagner Health Bill at the recent convention of the American Medical Association. Although the members of the House of Delegates at their meeting last October expressed their approval of most objectives included in the National Health Program, they did so with some definite and important reservations. These reservations, as well as other observations made, were completely ignored in drawing up the Wagner Bill. At their recent meeting the delegates took quite a different stand toward the Federal Health Program as expressed in the Wagner Bill. A resolution was introduced by Dr. Walter Donaldson, and supported by the delegates without a dissenting vote, in which the Wagner Bill was condemned in no uncertain terms and with twenty-two specific reasons given for their action. There may have been a few delegates who had dissenting opinions, but if so they did not care to assert themselves in view of the overwhelming majority of opinion.

The Wagner Health Bill is generally considered to embody most of the features of the Health Program of the Federal Interdepartmental Technical Committee. Denials have been made by members of the Public Health Service that they are responsible for the present form of the bill. In fact, it has been stated that they were not even consulted in drawing up the bill. However, most of the evidence would lead to the conclusion that this bill has met with the approval of those who are pushing the National Health Program.

A perusal of the records of hearings held before the Senate Committee which has the Wagner bill in charge is most instructive and illuminating. In the first place, one gains the impression that the members of this committee are well-meaning gentlemen who really have the best interests of the public at heart. They apparently have given the matter considerable thought and from the layman's standpoint might be regarded as fairly well informed on many phases of the subject of the care of health. It is a curious thing, however, that men who undoubtedly are well versed in the ways of the world should have introduced a bill on a technical subject which did not have the advice or counsel of experts



who are most interested. They probably thought they had done so when they received counsel from the Public Health officials and from the economists and social workers of the Security Board. It does not seem possible that a bill fraught with such grave importance to the public health and to medicine in the future should have been introduced without a conference with the men who have had charge of medical care throughout these years. The only opportunity which organized medicine has been given to present any evidence as to the wisdom of the laws proposed in the bill was at the hearing after it had been introduced. This simply does not make sense, but it is in keeping with the ruthless methods adopted by the small group who are controlling the health program sponsored by the Security Board.

One opportunity was given previously for presenting evidence by representatives of the medical profession and the American Medical Association. This was at a so-called Conference held in Washington under most adverse circumstances and after everything had been previously decided. The public has not been informed of the arbitrary methods employed in establishing the National Health Program. The members of the senate committee learned one thing, however, and that is that the best informed physicians throughout the country, who are quite in sympathy with some of the objectives of the Wagner Bill, are opposed to its present form. The senate committee learned that most doctors hold these opinions, not because they are members of the American Medical Association, or might be controlled by an alleged hierarchy in that Association, but that these opinions were their very own and were shared by the vast majority of practicing physicians. The members of the committee apparently are blind to the implications of the bill which menace the future of medicine. This is easy to understand, since the average layman cannot conceive of the dangers involved in governmental control of the practice of medicine. They do not seem to realize that opposition to the Bill on the part of the rank and file of practitioners is largely on idealistic grounds, namely that they fear that medicine itself would suffer. That is something which is difficult for the average layman to believe.

Another interesting feature of the senate in-

quiry was the fact that there was little unanimity among the physicians who spoke in opposition to the Wagner Bill regarding suggestions as to desirable changes in the Bill. Before another hearing is held it would be well to agree upon some common plan, or on certain principles which could be agreed upon by all. Apparently, the suggestion made by that able representative of medicine, Morris Fishbein, to the effect that the present bill be checked and entirely rewritten with the advice and counsel of representatives of medical practice, is the one that will be adopted. If the senate committee is really in earnest in its desire to improve the status of health, it will seek the information available in the medical profession and have frequent conferences with chosen representatives before another bill is introduced. They will also consult the vast amount of information available at the headquarters of the American Medical Association and the specialists who have this in charge. They could learn a great deal from the Survey of the Supply of Medical Care which recently was conducted under the guidance of the Bureau of Medical Economics of the American Medical Association. In fact, the answers to many of the questions which the senators raised in regard to the methods of improving public health are given in the suggestions made in the surveys of various county and state medical societies. One can point to no better direct answer for the best method of improving medical care, for which there unquestionably is need, than a perusal of the suggestions made by the Economic Committee of the Chicago Medical Society which have recently been published. Information made available by the American Medical Association Survey is most illuminating and far-reaching and undoubtedly offers more accurate data concerning the status of medical supply and the needs and ways for improvement than have ever been accumulated. This survey includes data which are so much at variance with the results of the National Health Survey as to make the latter appear quite unreliable and in fact ridiculous.

It has been reported that the Wagner Health Bill will not be reported out of the Committee at this session of Congress and will not be voted on. This is to be hoped for, so that time will be given for a thorough consideration of the problems involved by all those interested.—W.F.B.

### UNIQUE CONFERENCE

The Conference on Medical Problems held Friday, June 2, at the Minneapolis Auditorium presented a series of significant papers on the issues presented to the American people by the Wagner Health bill now before Congress.

Probably no more important or comprehensive statements of the varying viewpoints of principal agencies involved in the proposed program have ever been presented on one platform. The papers presented there by Surgeon E. R. Coffey of the United States Public Health Service (substituting for Assistant Surgeon General C. E. Waller); Dr. F. W. Jackson, deputy minister of health and public welfare of Manitoba; Monsignor Maurice F. Griffin, vice president of the Catholic Hospital Association; Dr. F. S. Chapin, chairman of the Department of Sociology at the University of Minnesota; President George Earl, and Senator Henrik Shipstead will be published in subsequent issues of MINNESOTA MEDICINE. They are not abstracted here because they should be read in full by every physician who is interested in the future of American medicine.

A large audience made up of nurses, social welfare workers, hospital administrators, dentists and druggists, as well as members of the association, remained throughout the day for this conference, which brought a unique meeting to its official close. Dr. F. J. Savage presided at the morning session, and Dr. W. F. Braasch in the afternoon.

### THE COUNCIL MEETS

May a single group of doctors, with the approval of the Council, set up a coöperative medical service in their own community?

The policy of the Council, enunciated as follows in response to this question, will serve as a guide for any group or any community that may wish to experiment with new methods of payment for medical services:

"Following the action taken by the House of Delegates of the American Medical Association in special session, February 15 and 16, 1935, which reaffirmed 'encouragement to local medical organizations to establish plans for the provision of adequate medical service for all of the people, adjusted to present economic conditions, by voluntary budgeting to meet the costs of illness,' the Council also records no objection to coöperative or insurance plans for medical services in any county provided they are approved, sponsored

and directed by the county medical society concerned. It is opposed to any private venture by a single doctor or group of doctors which is not approved by the local county medical society."

It was further specified that any member of the society who might wish to enter should be included in the plan.

### To Study Tests for Alcohol

A committee to study motor vehicle accidents and coöperate with authorities especially on the problem of alcoholic tests for drivers involved in accidents was approved by the Council. The president was instructed to appoint such a committee.

This action was taken because of impressive findings submitted by the American Medical Association's Committee to Study Motor Vehicle Accidents at St. Louis. This report showed, by tests made of the breath of 1,750 drivers chosen at random on the streets of Evanston compared with similar tests made on 270 drivers brought to Evanston hospitals after involvement in personal injury highway accidents, that 47 per cent of the drivers involved in accidents had alcohol in their blood, while only 12 per cent of the drivers selected at random had been drinking. Assuming that the chance of having an accident when no alcohol has been consumed is represented by the figure one, the chance of having an accident is 55 times greater when the average driver has 0.15 per cent or more alcohol in his blood.

The new committee will be appointed shortly. It will be instructed to coöperate with the authorities in developing satisfactory tests and in controlling the alcohol problem.

### Complaint

A formal complaint by the Redwood-Brown County Medical Society concerning lack of co-operation on the part of interns and fellows of the University Hospital and also unethical remarks to patients concerning referring physicians was brought before the Council and later discussed at length at a breakfast meeting to which University Hospital officials were invited. The problem was shown to be one of education in ethics, chiefly, and a renewed effort was promised to instruct the changing groups of interns and fellows on the University Hospital services in the fundamentals of courtesy and ethics to-

ward all physicians, and particularly toward referring physicians whose patients are treated in the University Hospital. The shortness of stenographic help, which sometimes makes adequate reporting to referring physicians by staff members extremely difficult, was emphasized to the Council. The University Hospital is over-crowded with a constant waiting list of approximately 600. Special instruction on ethical procedure in relationship to other physicians was suggested for the hospital staff meetings.

### Group Hospital Insurance

Group hospital insurance is being extended gradually by the Minnesota Hospital Service Association to communities outside the three large cities.

An application from one hospital in the state for approval by the Council was answered by the following motion which was read before the House of Delegates in subsequent sessions and which was designed to serve as a guide for any hospital or community which might be considering extension of hospital insurance:

"It is the sense of the Council that extension of hospital insurance through the Minnesota Hospital Service Association to the hospitals of any community in the state is entirely a matter for local handling and decision, and should be approved by the component medical society concerned."

### To Study Sex Crime

At the request of the Minnesota House of Representatives the Council empowered the President to appoint a committee to act with a similar committee from the Minnesota State Bar Association in a study of future legislation for control, regulation, segregation and treatment of persons afflicted with psychopathic personalities, particularly of potential sex criminals. Constitutionality of the preliminary legislation allowing for apprehension of potential sex criminals which was passed at the last session has been brought by test case before the Supreme Court of the state and now awaits ruling of the court.

### Disciplinary Action Recommended

Two complaints concerning failure of some physicians to comply with the laws were received by the Council.

One, from the State Board of Health, concerned failure to record births. The law requires all physicians to record every birth they

attend, and failure to do so renders them liable to penalty. The importance of complete birth records not only to vital statistics and thus to medical knowledge, but to the social security and old age benefit record of the individual, is obvious. It should not have to be argued to physicians. The Council recommended that physicians who fail to comply with the regulation be reported for disciplinary action by the State Board of Medical Examiners.

The second concerned refusal of a considerable number of physicians, reported by the Minnesota State Pharmaceutical Association, to comply with all provisions of the new barbitol legislation. All physicians recognize the danger of unrestricted sale of barbitol derivatives and every member of this association should be scrupulous in doing his part to carry out the law. In this case, also, the Council recommended that the pharmaceutical association be instructed to inform the State Board of Medical Examiners promptly concerning violations by physicians.

### Distinguished Service Medal

The distinguished service medal and scroll presented by the Minnesota State Medical Association to members for special contribution to the work of the association was voted by the Council to Dr. W. J. Mayo and to the late Drs. C. H. Mayo and H. M. Johnson. Photographs of each of the three will also be hung at the medical school of the University of Minnesota.

### Council to Act

Several matters concerned with the policies and program of the State Board of Health were brought before the Council by Dr. A. J. Chesley, executive officer, and by members of the Board.

A committee composed of physicians and lawyers for study of needed changes in certificates and procedure for registration of births was approved.

It was decided, also, that the Council as a whole would constitute itself as a committee to advise with the Board in any difficulties that may arise between the Board and the officials of federal or state agencies, particularly in the matter of narcotic violations.

A bill relating to control of silicosis and dust diseases in Minnesota is under consideration as part of the program of the Board on Industrial Hygiene and was referred to the Committee on Public Policy for study.

### Pneumonia Program Curtailed

The pneumonia control program will be affected seriously by the recent legislative curtailment of the Board's budget, the Council was told. Pneumonia serum can no longer be furnished on the former scale; but the Council approved continuance of the program to a limited extent. In accordance with this limited program, a small amount of serum will be made available through other biological funds. It will be provided free as far as possible, to those who cannot pay for it themselves. Serum will also be supplied at the reduced price secured by the Board to anyone who can pay for it. The diagnostic centers will be maintained throughout the state and arrangements will have to be made for prompt typing service to avoid delay. The cost of the serum used this spring has run between \$3,000 and \$4,000, the Council was told. It was suggested that arrangements might be made through County Welfare Boards to secure serum for relief clients.

### Control of Venereal Disease

At the request of Board members the venereal disease control program was reviewed by a special committee of the Council and the following recommendations were proposed and approved:

1. That free drugs for treatment be supplied only to those who are unable to pay for them.
2. That the present level of efficiency of laboratories used to make blood tests is satisfactory. However, standardization of laboratories is an optional matter and the assistance of the laboratory of the State Board of Health is requested to maintain all on a high level.
3. That a sum of money be set aside in the budget of the State Board of Health whereby physicians may be compensated for treatment of needy cases in accordance with a plan to be worked out by the Minnesota State Medical Association and with the money to be made available to the physicians through the state association.
4. That no new venereal disease clinic is needed at the present time in Minnesota.
5. That venereal disease should be treated as a matter of policy in the private office of any duly licensed practitioners of medicine.

The program for crippled children in Minnesota was reviewed for the Council by Dr. H. E.

Hilleboe, Director of Services for Crippled Children, and approved with a vote of appreciation for Dr. Hilleboe's work.

### Committee Enlarged

In accordance with the amendment to the constitution proposed by the Editing and Publishing Committee and passed by the House of Delegates, membership of the committee was increased to ten and the following new members were named by the Council: Dr. O. W. Rowe, Duluth, 1942; Dr. H. W. Meyerding, Rochester, 1939; Dr. P. F. Donohue, St. Paul, 1943; Dr. C. L. Oppegaard, Crookston, 1940; Dr. B. O. Mork, Jr., Worthington, 1941.

### "THE X-RAY BURN"

(Monthly editorial prepared by the Medical Advisory Committee)

In meeting large numbers of medical men attending medical conventions, one is struck by the great number of these men who show evidence of x-ray burns of the hands. This is especially evident, of course, among the older men who, through lack of knowledge of the potential seriousness of the frequent exposures without precautionary measures, exposed themselves to the rays, and burns of varying degrees resulted.

Your Medical Advisory Committee wishes to bring to the attention of the membership the possibility of serious untoward results from too frequent exposure of the accident case to x-ray in the taking of plates and doing fluoroscopic examinations. A case in point—this patient seriously injured through the pelvis and spine had six x-rays taken by his local physician. It was decided to take him to a consultant. Here, several more exposures were made and then he was entered in a hospital where, in order to complete records, he was again x-rayed. In all, some twenty exposures were made of his pelvis and back in forty-eight hours. Then within the week, in order to follow the healing process, more x-rays were made. An exaggerated case maybe, but well within the realm of actual happening. Would we be surprised if this man should show as the result of these multiple exposures an x-ray burn in a few months or that the sex glands might be seriously affected? As we all know, certain individuals have a marked idiosyncrasy to the x-ray, and more caution should be exercised with these patients than others.



Since these instruments of precision have possible sources of trouble easily overlooked in the hurry of active medical practice, we bring this thought to the membership at this time believing that "an ounce of prevention is worth" the proverbial "pound of cure."

As the spirit of coöperation becomes more and more evident among our membership, the frequent exchange of radiographs as a patient is transferred one to the other could be made with advantage not only to each surgical consultant but would surely prove better for the well-being of the patient.

The indemnity insurance carriers deplore the number of x-ray burns that they are called on to pay for. We can reduce premiums by lessening their frequency.—B.J.B.

#### MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

##### Osseo Farm Woman Sentenced to Four Year Prison Term

State of Minnesota vs. Anna Powers.

On June 9, 1939, Anna Powers, forty-nine years of age, was sentenced to a term of not to exceed four years at hard labor in the Women's Reformatory at Shakopee, Minnesota, for the crime of abortion. Mrs. Powers entered a plea of guilty on June 1, 1939, after a jury had been selected to try her on a charge of manslaughter in the first degree, following the death, on April 2, 1939, of an eighteen-year-old northeast Minneapolis girl at the farm home of the defendant near Osseo, Minnesota.

The investigation conducted by the Minnesota State Board of Medical Examiners, in coöperation with the sheriff's office and the county attorney's office of Hennepin County, disclosed a number of women, who, upon being questioned, stated that criminal abortions had been performed upon them by the defendant. Shortly after the arrest of the defendant, the young man who stated that he paid Mrs. Powers \$75.00 for the abortion in the case that resulted in the prosecution of Mrs. Powers, was found on a road in rural Ramsey County, with a bullet wound in his chest, which had been self-inflicted. The young man, however, made a remarkable recovery and the defendant, upon seeing the number of witnesses for the state on the date the trial opened, changed her mind and plead guilty.

Mr. Herbert T. Park of Minneapolis, one of the attorneys for the defendant, made a rather lengthy plea to the Court in which he asked that the sentence be suspended and the defendant placed on probation in his care. Mr. Park's plea was immediately denied by Judge Baldwin, who pointed out that the state had shown the defendant a great deal of consideration by permitting her to plead guilty to abortion rather than manslaughter. Judge Baldwin also pointed out that the state had available, in the event of trial, a number of witnesses who would testify to other abortions.

The Minnesota State Board of Medical Examiners is very grateful for the coöperation shown by Inspector Andrew Crummy of the county attorney's office, and the splendid handling of the case by Mr. Arthur Markve and Mr. Per Larson, assistant county

attorneys. Fine coöperation was also received from Drs. Gilbert Seashore and C. A. Hobbs, Coroner, and Deputy Coroner, respectively of Hennepin County.

#### Minneapolis Chiropractor Pleads Guilty to Unlawful Possession of Abortion Instruments

Re: State of Minnesota vs. Michael John Koehler

On May 24, 1939, Michael John Koehler, forty-two years of age, a licensed chiropractor with an office at 321 Kresge Building, Minneapolis, entered a plea of guilty in the District Court of Hennepin County, to an information charging him with the crime of illegally having in his possession instruments, drugs and medicine, for the causing of unlawful abortion. Koehler was sentenced by the Honorable Mathias Baldwin to pay a fine of \$150.00 and to serve a sentence of one year in the Minneapolis Workhouse. Upon the payment of the fine, Judge Baldwin ordered the jail sentence suspended and Koehler placed on probation in charge of the probation officer for Hennepin County. Under the laws of Minnesota, the maximum punishment for this particular offense is a jail sentence of not to exceed one year, or a fine of not to exceed \$500, or both.

Koehler was arrested on April 19, 1939, following the issuance of a complaint charging him with performing a criminal abortion on a twenty-five-year-old Minneapolis girl. Upon being arraigned, Koehler entered a plea of not guilty, had his trial set for May 4, 1939, and was released upon \$2,000.00 bond. It subsequently developed that the main witness for the state, the girl upon whom the alleged abortion was performed, was a rather unwilling witness for fear that she might cause trouble for the young man named by her as the one who made the arrangements for the alleged abortion. The girl stated to the Minneapolis Police Department that Koehler charged \$115.00, including a lady's diamond ring. Because of the reluctance of this witness to testify, Koehler was permitted to plead guilty to the lesser offense.

#### Sale of "Sekov Reducer" Capsules Leads to Arrest and Conviction

Re: State of Minnesota vs. Mary Petersen.

Re: Sekov Reducer Capsules.

Following a joint investigation by the St. Paul Police Department, the State Board of Pharmacy and the Minnesota State Board of Medical Examiners, Mary Petersen was arrested on May 25, 1939, following the issuance of a complaint charging her with practicing healing without a basic science certificate. The defendant, a married woman, waived preliminary hearing upon arraignment in the Municipal Court of St. Paul, and was held to the District Court. She entered a plea of guilty on May 31, 1939, and was sentenced on June 2, 1939, by the Honorable John W. Boerner, Judge of the District Court, to a term of 1 year in the Women's Reformatory at Shakopee. Because of the fact that the prosecution was instituted as a test case, and the frank statement made by the defendant that, under no circumstances, would she violate either the medical laws or the pharmacy laws of the State of Minnesota, the Court suspended the sentence and placed the defendant on probation for one year under the probation officer of Ramsey County.

The investigation disclosed that Mrs. Petersen came to St. Paul in March, 1939, from Eau Claire, Wisconsin, where she had resided for a year. Prior to that time, Mrs. Petersen stated she lived at Worthington,

Minnesota, for four years. She stated at the time of her arrest that she was the St. Paul representative of Sekov Reducer, Hollywood, California. She inserted ads in the local papers representing herself as maintaining a "health studio" at 428 New York Building, St. Paul. This address, however, was simply used as a means of contact with the public, and prospective patients were seen, either at their home, or at the home of Mrs. Petersen. Special appeal was made to those who were over weight. Part of the examination, conducted by Mrs. Petersen, consisted of obtaining information from the patients as to their height, age, weight, and also the following information with respect to the condition of their health: constipation, menstrual disorder, heart disorder, kidney disorder, operations, metabolism test, and particularly whether the patient was taking any other remedy. The patients were given literature indicating to them that by taking Sekov capsules the patients would reduce their weight and thereby avoid such ills "as heart disease, liver and kidney disorders, Bright's disease, high blood pressure, shortness of breath, dizziness, apoplexy, gout, dropsy and arteriosclerosis." Two kinds of capsules were suggested and recommended to the patients, a number 1 capsule to be taken one before the noon-day meal, and a number 2 capsule to be taken every other night just before retiring. The Sekov Company represented to their agents that Sekov "consists of herbs and the following glandular extracts: Thyroid, Ovarian and Pituitary." Mrs. Peterson stated that she was the agent for the St. Paul territory and that she purchased these capsules through a representative of this company in Minneapolis. She also stated that the product was owned by one Hazel Vokes of Hollywood, California, and that Sekov is coined by spelling the name Vokes backward. These capsules were sold to the patient at \$5.50 per box, each box containing a thirty days' supply. A three months' supply was sold for \$15.00.

The facts in this case indicate, quite clearly, a violation of not only the basic science law of Minnesota, but also the medical act and the pharmacy laws. The defendant in the instant case admitted that she had no training whatsoever in medicine and holds no license to practice any form of healing in the State of Minnesota.

The Medical Board wishes particularly to mention the fine coöperation in this case on the part of the St. Paul Police Department, the State Board of Pharmacy and Mr. James F. Lynch, Assistant County Attorney of Ramsey County.

### Jury Disagrees in Trial of Minneapolis Chiropractor

Re: State of Minnesota *vs.* Arthur J. Kolling

After deliberating more than twenty-six hours, a jury of nine women and three men, in the court of Judge Lars O. Rue of the Hennepin County district court, reported that it was unable to reach a verdict on the guilt or innocence of the defendant, Arthur J. Kolling, a Minneapolis chiropractor being tried on an indictment in which he was charged with practicing medicine without a license. The case was given to the jury at 3:30 o'clock p. m. on June 20, 1939, and at 6 o'clock p. m. the next day the jury was discharged by Judge Rue. It is reported that the jury was deadlocked six to six. The case will be re-tried at the September term of Court.

The defendant, who is licensed to practice chiropractic in Minnesota and who owns the Hennepin Clinic at 805 LaSalle Avenue, Minneapolis, was indicted by the Grand Jury on May 16, 1939, on a charge of practicing medicine without a license. The state introduced evidence at the trial that Kolling had sutured a wound of a ten year old boy with surgical catgut. The boy

had been injured by an automobile at 8th and LaSalle and removed to the office of the defendant by the office assistant of the defendant. The accident happened at 4:15 o'clock p. m. on April 14, 1939. Despite the fact that the ambulance was called and that the accident occurred within one block of the Medical Arts Building, at a time when hundreds of medical men were available the case was described by counsel for the defendant as an "emergency." The parents of the boy called their family physician who promptly removed the boy to the hospital. On April 28 a statement for "services rendered" in the amount of \$25.00 was sent on the stationery of the Hennepin Clinic.

Kolling did not take the witness stand in his own behalf but introduced testimony that the \$25.00 charge made was to cover the damage done to his office and his equipment by the boy becoming nauseated, which he estimated at \$10.00 and the balance of \$15.00 to go to W. D. Hammond, M.D., for services. Dr. Hammond is registered with the Medical Board from 106 Washington Avenue South, which is the location of the Health Institute, specializing in "diseases of men." Dr. Hammond testified for the state and denied the boy was his patient and stated that the suturing was done by the defendant with catgut and surgical instruments owned by the defendant. Dr. Hammond's name appeared on the door of the Hennepin Clinic on that date but he testified that he had no arrangement with the defendant but was considering purchasing the place from Kolling. It also developed that the office assistant of the defendant is the wife of Dr. Hammond. Mrs. Hammond also testified for the state and stated that she was paid \$5.00 per week for her services at the Hennepin Clinic.

Kolling was fined \$150.00 in 1928 in the district court of Hennepin county following his plea of guilty to a charge of practicing medicine. He was also fined \$2,000.00 in 1938 in United States District Court following his plea of guilty to a charge of violating the internal revenue laws of the United States in connection with the alleged diversion of industrial alcohol. Kolling paid the fine and is on probation for 3 years on a suspended sentence of two years in prison in the same case.

### List of Physicians Licensed by the Minnesota State Board of Medical Examiners on May 11, 1939

#### By Examination

Balmer, Albert Irwin, U. of Minn., M.D. 1938, Pipestone, Minn.  
Baumann, Milton Charles, U. of Ill., M.D. 1937, Gaylord, Mich.  
Beach, Northrop, Harvard Med. Col., M.D. 1938, Minneapolis  
Berry, Maxwell Rufus, Jr., Cornell U., M.D. 1935, Rochester, Minn.  
Blair, Herbert Milton, U. of Minn., M.D. 1938, St. Paul  
Braun, Ohrmundt Carl, U. of Minn., M.B. 1939, Minneapolis  
Campbell, Lorne Alexander, Jr., U. of Minn., M.B. 1938, Eloise, Mich.  
Chapman, Asher Spaford, Northwestern, M.B. 1937, M.D. 1938, Rochester, Minn.  
Chlad, Arnold Joseph, U. of Minn., M.B. 1938, St. Paul, Minn.  
Clarke, Eric Kent, U. of Toronto, M.B. 1916, Minneapolis  
Clegg, Reed Smoot, Northwestern U., M.B. 1936, M.D. 1937, Rochester, Minn.  
Dahle, Manfred Benjamin, Rush Med. Col., M.D. 1938, Minneapolis

# MEDICAL ECONOMICS

- Dressel, Paul Arthur, U. of Minn., M.B. 1939, Elkton, S. Dak.
- Eginton, Charles Theodore, U. of Minn., M.B. 1938, St. Paul
- Erickson, John Walfred, Creighton U., M.D. 1938, Minneapolis
- Even, Martin Morris, U. of Minn., M.B. 1939, 616 N. 18th Ave. E., Duluth, Minn.
- Geib, Marvin Jacob, U. of Minn., M.B. 1938, Minneapolis
- Giles, Francis Emmett, U. of Minn., M.B. 1938, Nashwauk, Minn.
- Greathouse, John Dallas, Jr., U. of Minn., M.B. 1939, Minneapolis
- Griffin, Vernon M., U. of Ore., M.D. 1938, St. Paul
- Gullickson, Miles Justin, U. of Minn., M.B. 1934, M.D. 1935, Minneapolis
- Hartman, Jack, U. of Minn., M.B. 1939, Minneapolis
- Hill, John Roger, Ohio State U., M.D. 1936, Rochester, Minn.
- Howe, Rulon Fuller, U. of Chicago, M.D. 1937, Rochester, Minn.
- Huebner, Jewel Steiner, U. of Wis., M.D. 1938, Duluth, Minn.
- Johnson, Raymond Alfred, U. of Minn., M.B. 1939, Winthrop, Minn.
- Johnson, Vilhelm Manual, U. of Minn., M.B. 1939, Dawson, Minn.
- Kapernick, John Stuart, U. of Ill., M.D. 1937, Rochester, Minn.
- King, Harry Edward, Western Reserve, M.D. 1936, Rochester, Minn.
- Knights, John A., Jr., Geo. Wash. U., M.D. 1936, Detroit, Mich.
- Knutson, George Olaf, Northwestern, M.B. 1937, M.D. 1938, Negaunee, Mich.
- Kohlmeyer, Frederick Charles, U. of Minn., M.B. 1939, Blue Earth, Minn.
- Kyser, Franklin Arthur, Northwestern, M.D. 1938, Rochester, Minn.
- Lambert, Lois Ruth, U. of Minn., M.B. 1938, Minneapolis
- Lambertus, Paul Theodore, Rush Med. Col., M.D. 1935, Rochester, Minn.
- Larrabee, Walter Freemon, Jr., U. of Minn., M.B. 1939, Chippewa Falls, Wis.
- Larson, Everel Arthur, U. of Minn., M.B. 1938, St. Paul, Minn.
- Licht, Hersh, U. of Minn., M.B. 1938, Minneapolis
- Little, Edgar Hugh, Washington U., M.D. 1937, Rochester, Minn.
- Llewellyn, Maxwell Bowler, U. of Minn., M.B. 1939, St. Paul, Minn.
- Locke, William, U. of Manitoba, M.D. 1938, Rochester, Minn.
- Maino, Charles Runston, Stanford U., M.D. 1938, Rochester, Minn.
- Mason, Bernard Augustine, McGill U., M.D. 1937, Rochester, Minn.
- McCall, Cooper Holtzclaw, Johns Hopkins U., M.D. 1936, Rochester, Minn.
- McCannel, Donald Archibald, Rush Med. Col., M.D. 1937, Rochester, Minn.
- McCloud, Charles Naumann, U. of Minn., M.B. 1939, St. Paul
- McGee, Horace Duane, Rush Med. Col., M.D. 1938, St. Paul, Minn.
- McLoughlin, Christopher John, Hahnemann Med. Col., Phila., M.D. 1937, Rochester
- Meyer, Wallace Martin, U. of Minn., M.B. 1939, Rochester
- Miller, Harold Edmund, U. of Minn., M.D., 1937, Minneapolis
- Miller, Harry Allen, U. of Minn., M.B. 1939, Fairmont, Minn.
- Moir, William Wilmerding, Jr., U. of Minn., M.B. 1938, M.D. 1939, Minneapolis
- Murray, Robert Alexander, U. of Minn., M.B. 1939, Minneapolis
- Naegeli, Frank De Lee, U. of Minn., M.B. 1936, M.D. 1937, Minneapolis
- Nickel, Walter Russell, U. of Minn., M.B. 1937, M.D. 1938, Rochester, Minn.
- O'Donnell, Joseph Edmond, Northwestern, M.B. 1933, M.D. 1934, Rochester, Minn.
- Ostergren, Eva-Jane, U. of Minn., M.B. 1938, St. Paul
- Perry, Thorton Tayloe III, U. of Virginia, M.D. 1937, Rochester
- Peterson, Osler Luther, U. of Minn., M.B. 1938, Minneapolis
- Plimpton, Nathan Cope, Jr., Rush Med. Col., M.D. 1937, Rochester, Minn.
- Reader, Donald Richard, U. of Minn., M.B. 1938, Minneapolis
- Richardson, Ralph Dennett, Harvard, M.D., 1935, Rochester, Minn.
- Robb, Charles Stuart, U. of Minn., M.B. 1939, Duluth, Minn.
- Rogers, Robert Gifford, U. of Minn., M.B. 1939, Minneapolis
- Roth, George Clark, Northwestern, M.B. 1937, M.D. 1938, St. Paul
- Sax, Milton Herbert, Rush Med. Col., M.D. 1937, Eveleth, Minn.
- Schroeckenstein, Hugo Franz, U. of Minn., M.B. 1938, St. Paul
- Smith, Larry Allen, Northwestern, M.B. 1938, St. Paul
- Sorem, Milton B., U. of Minn., M.B. 1938, St. Paul
- Sullivan, Arthur William, U. of Ore., M.D. 1938, St. Paul
- Sutton, Edmund Benedict, U. of Vermont, M.D. 1937, Rochester
- Tischer, E. Paul, Indiana Univ., M.D. 1937, Rochester
- Twyman, Richard Allen, Northwestern U., M.B. 1937, M.D. 1938, Rochester, Minn.
- Vanderhoof, Edward Spaulding, U. of Minn., M.B., 1939, Minneapolis
- Vinje, Edmund Gordon, Northwestern, M.B. 1938, St. Paul
- Walsh, William Thomas, U. of Minn., M.B. 1938, Minneapolis
- Wiig, Laurence Maxon, U. of Pa., M.D. 1933, Rochester, Minn.
- Wold, Lester Eugene, Rush Med. Col., M.D. 1938, St. Paul
- Youel, Milo Ashbel, U. of Minn., M.B. 1939, Lake Park, Minn.

## By Reciprocity

- Cunningham, Charles Barnard, U. of Mich., M.D. 1934, Virginia, Minn.
- Kibler, John Martin, Johns Hopkins U., M.D. 1935, Rochester, Minn.
- Skarshaug, Harvey James, U. of Iowa, M.D. 1926, Spring Valley, Minn.
- Sorum, Frithjof Thorvald, Rush Med. Col., M.D. 1934, Jasper, Minn.

## National Board Credentials

- Barrett, Richard Henry, U. of Vermont, M.D. 1937, Rochester, Minn.
- Pennington, Robert Edward, U. of Pa., M.D. 1936, Rochester, Minn.

## In Memoriam

Charles Horace Mayo

1865-1939

CHARLES H. MAYO, well known not only locally but throughout the world as the younger of the Mayo Brothers of Rochester, Minnesota, died of pneumonia at Mercy Hospital in Chicago, May 26, 1939, at the age of seventy-three.



DR. CHARLES H. MAYO

Born in Rochester, Minnesota, July 19, 1865, the son of William Worrell Mayo and Louise Wright Mayo and younger by four years than his brother, William J., Charlie, as he was known as a boy and to his more intimate acquaintances throughout his life, attended local grade and high school. After attending Niles Academy, he obtained his medical degree from Chicago Medical College, later known as Northwestern University, in 1888. He spent the next year at the New York Polyclinic and the following year in the New York Post Graduate Medical School.

Returning to Rochester he joined his father and brother in practice and soon established a group known as the Mayo Clinic. Dr. Charlie specialized in surgery of the head and neck and made early contributions to goiter and brain surgery. The tornado which hit Rochester in 1883 is said to have led to the building of Saint Mary's Hospital in that year by the Catholic Order of Saint Francis in a plot of twenty acres donated by Dr. W. W. Mayo.

Soon after beginning practice Dr. Charlie published his first medical paper, one written with his brother, which appeared in the *Northwestern Lancet* of November, 1891. Since that time scarcely a year has passed without a contribution on some phase of medicine or,

as in later years the fields of philosophy, economics and statesmanship.

The recognition of his ability and attainments in the way of awards, degrees, titles, active and honorary positions, are too numerous to list here. They include a distinguished service medal from the United States government; designation as an officer of the national legion of honor of France, and Cross of Knight Commander of the Royal Order of the Crown of Italy.

Always active in medical organizations, Dr. Charles H. Mayo, was president of the Western Surgical Association in 1904, the Minnesota State Medical Association in 1905, the Society of Clinical Surgery in 1911, the Clinical Congress of Surgeons of North America in 1914, the American Medical Association in 1916, the American College of Surgeons in 1924, the American Surgical Association in 1931 and the Minnesota Public Health Association from 1932 to 1936.

A long list of honorary degrees conferred upon him include the Master of Arts degree conferred by Northwestern University in 1904, fellowship in the Royal College of Surgeons in England in 1920 and in the Royal Society of Medicine in 1926, master in chirurgy by Trinity College of Dublin in 1925. He was made Doctor of Science by the University of Leeds, England, in 1909, Doctor of Public Health by the Detroit College of Medicine and Surgery in 1927, Doctor of Science by Princeton University in 1917 and the University of Pennsylvania in 1925. He also received the honorary degree of LL.D. from the University of Maryland in 1909, Kenyon College in 1916, Northwestern University in 1921, the University of Edinburgh in 1925, Queen's University (Belfast) in 1925, the University of Manchester (England) in 1929, Hamline University in 1930 and Carleton College in 1932.

During the World War Dr. Charlie alternated every six months with his brother Dr. Will between Rochester, where they conducted postgraduate medical courses, and Washington, where they served in the personnel department of the medical corps of the Army. Dr. Charles Mayo was commissioned Major in the medical corps, April 19, 1917; Colonel, June 15, 1918, and Brigadier General in the reserve, November 22, 1921.

In 1893, Dr. Charles Mayo married Edith Graham of Rochester, Minnesota. He is survived by his widow and the following five of their eight children: Dr. Charles W. Mayo, Dorothy, Mrs. Fred W. Rankin, and Mrs. George T. Frenhohn all of Rochester, and Mrs. John B. Hartzell of Detroit, Michigan. Another son, Dr. Joseph Mayo, was killed in an automobile accident in 1936.

Dr. Charles Mayo was one of the guiding geniuses that caused the development in Rochester of a world center for medical education and research in the space of one life time. He leaves behind him a monument to his industry and life philosophy, and his family has the satisfaction that in a large measure he attained his life purpose attested early in his career, of relieving the greatest possible amount of physical suffering.

MINNESOTA MEDICINE



## IN MEMORIAM

### Henry H. Helk 1879-1939

**D**R. HENRY H. HELK, Minneapolis, died suddenly of a heart attack at his home, March 16, 1939.

Henry H. Helk was born in Arkansas, Wisconsin, November 4, 1879. He came, when a small boy, with his family to reside in Minneapolis, where he attended public schools.

He received his medical degree from the University of Minnesota in 1902, having been the first president of the local chapter of the Phi Rho Sigma medical fraternity.

After serving his internship at St. Joseph's Hospital, St. Paul, Minnesota, in 1902-1903, he practiced medicine for six months in Butte, Montana. He also served as railroad surgeon for the Great Northern Railroad during that time. After that he located in Minneapolis, where he practiced continually until his death.

During the time Dr. Helk practiced in Minneapolis he was on the staff at St. Barnabas Hospital, being chief of staff about eight years previous to the time of his death.

He was a member of the Automobile Club of Minneapolis, a former member of the Elks' Lodge, and was the examining physician for the Elks' Lodge for many years. He was a member of the Hennepin County Medical Society, the Minnesota State Medical and the American Medical Associations.

Dr. Helk had a host of friends among members of the medical profession and was called upon to act as toastmaster on many medical occasions.

### McClelland Shellman 1909-1939

**D**R. McCLELLAND SHELLMAN, who died after a nine-day illness in New York City on May 6, 1939, was born in Nashwauk, Minnesota, on January 1, 1909, the son of Dr. and Mrs. John L. Shellman, St. Paul, and grandson of Dr. Edward Dann, a pioneer physician and surgeon of southwestern Minnesota. He is survived by his widow and infant son, McClelland, Jr.

He spent his boyhood in St. Paul and graduated from the Central High School in 1926. Active in athletics, he was captain of the Central High School baseball team and was chosen "intercity star" in baseball.

After graduating from the high school, he entered the University of Minnesota Medical School, from which he was graduated in 1932 with a B.A. degree and in 1933 with an M.D. degree. While at the University he served as his class president and medical school representative on the University Student Council; he was a member of the Incus, honorary medical society; Phi Gamma Delta Fraternity and Nu Sigma Nu Medical Fraternity.

He served one year as house physician at the Milwaukee County Hospital. He practiced a few months in Nashwauk, Minnesota, and then returned

to Milwaukee for a special nine months' course in pathology of the eye. Upon its completion, he entered the Billings Eye Hospital of the University of Chicago, for special training in ophthalmology, where he studied for three years. He was then appointed instructor in eye surgery, the youngest Billings trained graduate to serve in that capacity.

In February, 1938, Dr. Shellman moved to New York City and became associated with Dr. R. Townsley Paton, with offices at 927 Park Ave., New York City, in the practice of ophthalmology. He also was on the staff of the Manhattan Eye Hospital and Post Graduate School as lecturer and surgeon. He was a lecturer for the Society for the Prevention of Blindness at Rockefeller Center; lecturer on Perimetry and Color Blindness at the New York University Medical School and at the Columbia University Medical School.

Dr. Shellman was an earnest student and indefatigable worker. He became a skilled eye surgeon for a man so young in years. "Doctor Mac," as he was popularly known, left a proud record of service in his chosen specialty of ophthalmology.

### Elmer C. Hanson 1896-1939

**D**R. ELMER HANSON, formerly of Park Rapids, but since last September a resident of Austin, died suddenly in his office of a heart attack on June 23, 1939, at the age of forty-two. He was a member of the Methodist Church. He was also a member of the Mower County Medical Society, the Minnesota State and American Medical Associations. Although a resident of Austin but a short time he was held in high regard by the many friends he had made. His wife and daughter, Betty, survive.

### SULFAPYRIDINE

After careful study, the U. S. Food and Drug Administration has granted the right to manufacturers to distribute sulfapyridine in interstate commerce under the stipulations of the act dealing with new drugs. During the period when sulfapyridine was under consideration, *The Journal* and the Council on Pharmacy and Chemistry made every effort to obtain essential information concerning its usefulness in the treatment of various types of pneumonia and, in so doing, has consulted approximately 100 physicians who have replied to inquiry giving the details of their experiences with the drug. The replies received indicate that it is essential wherever possible to type each case of pneumonia before this drug is administered, because it has been reported by a number of investigators that there are cases of pneumonia which do not respond to this drug and have subsequently responded to the specific antisera. It remains to be determined just how effective it is and just how well it will compare with antiserum in various epidemics over a course of years in various types of pneumococcal infections. The Council on Pharmacy and Chemistry has voted to accept sulfapyridine for inclusion in New and Non-official Remedies (*The Journal*, May 6, 1939, p. 1831) and to proceed with the consideration of the submitted brands of the drug. (J.A.M.A., May 6, 1939, p. 1830.)

## REPORTS and ANNOUNCEMENTS

### MEDICAL BROADCAST FOR JULY

The Minnesota State Medical Association Morning Health Service.

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis (810 kilocycles or 370.2 meters) and Station WLB, University of Minnesota (760 kilocycles or 395 meters).

*Speaker:* William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows:

July 1—Drowning

July 8—Postgraduate Medical and Hospital Education

July 15—Hot Weather Health Hints

July 22—Poison Ivy

July 29—Oral Hygiene

### TWELFTH GRADUATE FORTNIGHT OF THE NEW YORK ACADEMY OF MEDICINE

The Twelfth Graduate Fortnight of the New York Academy of Medicine will be held October 23 to November 3, 1939. Clinics will be held each afternoon at fifteen of the leading hospitals of New York and each evening will be devoted to addresses by leading endocrinologists from throughout the country. Names which appear on the evening program include Herbert M. Evans, J. B. Collip, Elmer L. Sevringhaus, David Marine, Frank H. Lahey, Walter B. Cannon, Robert F. Loeb, Hugh H. Young, R. T. Woodyatt, J. F. Fulton, William G. MacCallum, Carl R. Moore. Morning conferences are tentatively planned and a comprehensive scientific exhibit will be on display. A registration fee of \$5.00 will be charged. A complete program may be obtained by writing The New York Academy of Medicine, 2 East 103 Street, New York City.

### BIOLOGICAL PHOTOGRAPHIC ASSOCIATION

The ninth annual convention of the Biological Photographic Association will be held September 14 to 16, 1939, at the Mellon Institute for Industrial Research, Pittsburgh, Pennsylvania. The program will be of interest to scientific photographers, scientists who use photography as an aid in their work, teachers in the biological fields, technical experts and serious amateurs. It will include discussions of motion picture and still photography, photomicrography, color and monochrome films, processing, et cetera, all in the field of scientific illustrating.

Further information about the Association and the convention may be obtained by writing the Secretary of the Biological Photographic Association, University Office, Magee Hospital, Pittsburgh, Pennsylvania.

### STATE MEETING

The Eighty-sixth Annual Meeting of the Minnesota State Medical Association closed its three-day session, June 2, at the Minneapolis Auditorium with a registration of 4,339 persons, of whom 2,081 were physicians and a unique record of contribution to many fields of medicine and the public health.

In addition to a distinguished scientific program this meeting provided a successful and significant conference on the social and economic problems of medicine and also a new venture into the field of public health education which took the form of a public health exposition. The health exposition was held in the Auditorium, also, with the assistance of all the official and volunteer health agencies and it was open to the public for four days, ending Saturday, June 3.

The meeting in its entirety served as an interesting index of the current problems and preoccupations of medical men in Minnesota.

Fractures bulked large in the scientific program as they do in the practice of most physicians particularly in rural communities. The fracture demonstration of Wednesday, and the subsequent luncheon, dinner and evening meeting, addressed by Dr. C. L. Scudder of Boston, proved to be a popular feature of the meeting. Likewise, the twenty round-table luncheons demonstrated their appeal and will undoubtedly be incorporated in the convention schedule wherever facilities are available for them.

No review of the eventful three days would be complete, either, without mention of the banquet which, under the chairmanship of Dr. Gilbert Thomas of Minneapolis, was probably more thoroughly enjoyed than any other in the history of the Association. Tables were set up in the meeting hall and entertainment which included a twenty-eight piece orchestra from members of the Minneapolis Symphony Orchestra together with singing and dancing was given on the stage. The dinner took the form of a smorgasbord in place of the traditional banquet, and the only talk was a fine address by Governor Harold E. Stassen. Special thanks are due to Dr. Thomas, Chairman, and the Hennepin County Medical Society as hosts for the occasion.

The 1939 medal winner for the best individual scientific exhibit was Dr. Vernon L. Hart of Minneapolis for his exhibition on fracture problems. The medal is the annual gift of the Southern Minnesota Medical Association.

Proceedings of the House of Delegates and Council are briefly reviewed elsewhere in this issue and will be published in full in an early issue of the journal.

The officers elected for the new year are as follows: B. S. Adams, Hibbing, president-elect, to take office January 1, 1940; Carl M. Johnson of Dawson, first vice president; A. E. Cardle of Minneapolis, second vice president; B. B. Souster, St. Paul,

## REPORTS AND ANNOUNCEMENTS

re-elected secretary; W. H. Condit, Minneapolis, re-elected treasurer; W. W. Will, Bertha, re-elected speaker of the House of Delegates; E. A. Meyerding, St. Paul, re-elected vice speaker; A. E. Sohmer, Manikato, elected to take the place of Dr. Holbrook as Councilor of the Fourth District, who retired this year; C. A. Stewart, Minneapolis, re-elected Councilor of the Sixth District; W. L. Burnap, Fergus Falls, re-elected Councilor of the Eighth District; and F. J. Elias, Duluth, elected to take the place left vacant by Dr. Adams as Councilor of the Ninth District. F. J. Savage, St. Paul, was elected Delegate to the American Medical Association, and J. M. Hayes, Minneapolis, alternate.

Rochester is the meeting place selected for 1940. Meeting headquarters will be at the new Rochester Auditorium. The dates will be chosen later by the Council.

### EAST CENTRAL MINNESOTA SOCIETY

The East Central Minnesota Medical Society held its spring meeting at Pokegama Sanatorium at Pine City, on Thursday, May 25. Elected to membership were Dr. Gordon Tesch, Elk River; Dr. Robert Leighton, Rush City; Dr. Richard Whitney, Cambridge; Dr. J. Y. Feinstein, Cambridge; Dr. Frank Mork, Anoka, and Dr. B. W. Bunker, Anoka.

A new constitution was adopted.

Dinner was served and a scientific program was presented by guest speakers. Dr. Edward Evans, Minneapolis, spoke on "Foot Conditions," and Dr. James Kerr Anderson, Minneapolis, demonstrated, with slides, a talk on "Hemorrhoidectomy; Indications and Technic."

### WOMEN'S AUXILIARY

MRS. A. C. BAKER, Fergus Falls, *President*  
MRS. E. V. GLOTZ, 2259 Summit Avenue,  
Saint Paul, *Publicity Chairman*

**A** MOST successful annual meeting of the Women's Auxiliary of the Minnesota State Medical Association was held May 31, June 1, 2, and 3, in Minneapolis with a very good attendance. Just before the convention, the state president, Mrs. Wm. B. Roberts of Minneapolis, was called East by the illness of a close relative and was unable to preside at the meetings. It was a keen disappointment not only for her but for the members as well, who missed her graciousness and cordial personality. Mrs. John James Ryan of Saint Paul, second vice president, presided in the absence of Mrs. Malcolm Gillespie of Duluth, who was unable to attend.

The convention opened with registration Wednesday morning, May 31, at 8 A. M. at the Curtis Hotel. An Executive Board meeting was held at 10:30 A. M. at the Leamington Hotel and was followed by luncheon. The Women's Auxiliary of the Hennepin County Medical Association entertained all visiting doctors' wives at a delightful tea which was held that afternoon at 3:30 in the Hennepin County Medical Society Rooms,

Medical Arts Building. The state officers were the honored guests. In the evening from 7 to 11 o'clock the Public Health Exposition was held in the Minneapolis Auditorium. Thursday, June 1, the annual meeting was held at Interlachen Country Club at 10:00 A. M. Mrs. R. R. Cranmer, retiring president of the Hennepin County Auxiliary, gave a very cordial welcome, to which Mrs. R. H. Wilson of Winona responded. The Memorial Service was conducted by Mrs. C. F. Ewing of Wheaton. Reports from the officers and various county presidents were followed by the election of officers.

Newly elected officers include Mrs. A. C. Baker, Fergus Falls, president; Mrs. M. A. Nicholson, Duluth, president-elect; Mrs. John James Ryan, St. Paul, first vice president; Mrs. B. A. Robertson, Austin, third vice president; Mrs. T. N. Flemming, St. Cloud, second vice president; Mrs. R. J. Josewski, Stillwater, Minnesota, recording secretary; Mrs. N. H. Baker, Fergus Falls, corresponding secretary; Mrs. R. R. Noice, Minneapolis, treasurer; Mrs. W. W. Moir, Minneapolis, auditor; Mrs. E. C. Eshelby, St. Paul, parliamentarian; Mrs. J. B. Gaida, St. Cloud, historian. The new advisory committee includes Mrs. J. F. Norman, Crookston; Mrs. E. M. Hammes, St. Paul; Mrs. O. O. Larsen, Detroit Lakes. Luncheon followed at the club with Dr. F. W. Jackson of Winnipeg as guest speaker, who gave a splendid talk on "Motherhood and Medicine." Dr. Jackson is Deputy Minister of Health and Public Welfare of Manitoba. Mrs. F. J. Elias of Duluth presented Mrs. A. C. Baker with the President's Pin, and Mrs. Baker responded with greetings.

A post-convention board meeting followed the luncheon with Mrs. Baker, presiding. The new committee chairmen were announced and include: Organization, Mrs. M. A. Nicholson, Duluth; Finance, Mrs. James Blake, Hopkins; Legislation, Mrs. L. L. Sogge, Windom; Public Relations, Mrs. A. F. Branton, Willmar; Hygeia, Mrs. W. W. Will, Bertha; Health Education, Mrs. J. A. Thabes, Sr., Brainerd; Press and Publicity, Mrs. E. V. Goltz, St. Paul; Printing, Mrs. R. R. Cranmer, Minneapolis; Exhibits, Mrs. M. S. Henderson, Rochester; Resolutions, Mrs. Charles Colstra, Ortonville; Archives, Mrs. S. S. Hesselgrave, St. Paul. The Social Committee for the year will include Mrs. B. F. Davis, Duluth; Mrs. C. C. Chatterton, St. Paul; Mrs. Martin Nordland, Minneapolis.

A most enjoyable banquet was held that night at 7:00 P. M. with Dr. George Earl, president of the Minnesota State Medical Association, as toastmaster; Mrs. A. C. Baker, the new president of the Auxiliary, was introduced and gave a splendid talk.

Friday, June 2, visitors were taken to the Sibley house at Mendota for luncheon and a tour of the historic buildings there.

Members of the Hennepin County Auxiliary proved perfect hostesses, and everything was done to insure a delightful time for those attending the meetings.

Minnesota is favored in having two members on the National Board this coming year. Mrs. James Blake of Hopkins was reelected Chairman of Finance, and Mrs. John J. Ryan of St. Paul was appointed historian.

## PROCEEDINGS of the MINNESOTA ACADEMY OF MEDICINE

Meeting of April 12, 1939

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, April 12, 1939. Dinner was served at seven o'clock and the meeting was called to order at eight o'clock by the president, Dr. Carl B. Drake.

There were forty-two members present.

Minutes of the March meeting were read and approved. The proposed amendments to Article III, Section 1, and Article III, Section 2, which has been proposed at the March meeting and published in the bulletin for the April meeting were voted upon and carried.

The scientific program was as follows:

### EARLY CANCER OF THE LARYNX

KENNETH A. PHELPS, M.D.

*Minneapolis*

Early diagnosis is generally conceded to be the keynote of the control and cure of cancer, regardless of its location. The diagnosis of early cancer is much more complicated than that of the advanced disease, because it is possible to examine a lesion in such an early stage that there may be some question of its being neoplastic. This is becoming recognized as the public comes earlier for examination.<sup>1</sup>

For years, cancer of the larynx has been classified as extrinsic or intrinsic. This has resulted in some confusion as to whether the classification was based on anatomical or clinical grounds. We need no such classification for the purpose of this discussion. In making the diagnosis, "cancer of the larynx," the important thing is to establish the precise point of origin of the disease. There are four locations to consider: (1) the vestibule (the free border and the laryngeal surface of the epiglottis and the ventricular bands); (2) the ventricle; (3) the vocal cords; (4) the subglottic area. Cancers originating in these four areas differ in their symptomatology, extension (local or general), therapy and prognosis.

The histology of the larynx has an important bearing upon the growth, lymphatic involvement and radiosensitivity of epitheliomas, which may arise from its mucous membrane. The larynx is located where the air and food passages cross. Embryologically, the portion of the larynx above the vocal cords arises from the floor of the pharynx; while the vocal cords and below are a part of the original pulmonary outgrowth from the esophagus (foregut).

The epithelium of the upper respiratory tract is of the cylindric form, that of the upper digestive tract is of the squamous type. As the individual grows older, these types change where the two tracts come together. At birth, cylindric epithelium lines the larynx, except for the edge of the vocal cords. Due to normal metaplasia, these cells gradually become pavement in type

and eventually cover the epiglottis, aryepiglottic folds, vocal cords, and, at times, the ventricular bands; though here a few foci of cylindric epithelium usually persist. Below the cords the pavement epithelium gradually merges into the cylindric, ciliated epithelium of the trachea.

Epitheliomas arising above the vocal cords are made up of cells which tend to be of less hornifying type and are more radiosensitive. Those from the cords and subglottic area are more differentiated, and call for surgical rather than radiation therapy.

The exact cause of cancer is not known, but certain predisposing causes, called by Dr. Jackson<sup>2</sup> "precancerous lesions," have been considered by him to have an etiological bearing. Jackson believes the causative factor in about 65 per cent of cases is vocal abuse which is responsible for chronic laryngitis, keratosis and granuloma. He cites the therapeutic value of vocal rest in these conditions. He considers chronic laryngitis, keratosis, granuloma, papilloma, leukoplakia, chronic irritation, and benign tumor as precancerous lesions. Sir St. Clair Thomson<sup>3</sup> in his book says there is no proof that these conditions are precancerous lesions and he also excludes lues, chronic irritation, heredity, excessive use of alcohol or tobacco. He challenges Jackson's contentions thus: "If vocal abuse were a predisposing factor cancer of the larynx would occur more often. The fact that cancer is ten times more frequent in men than women lends no support to his contention." He does not believe in precancerous lesions, and states cancer rarely follows benign tumors. Nevertheless, it seems generally agreed that long continued irritation plays a role in the genesis of malignant tumors. The histological features of precancerous lesions will be discussed later.

Just why cancer of the larynx so rarely occurs in females is not known. However, cancer in women commonly affects the uterus or breasts and perhaps this predilection is a factor of safety to the female larynx, (E. T. Bell).

Hoarseness is the most important early symptom of cancer of the larynx. Any patient whose hoarseness has persisted for three or four weeks is entitled to a complete history and physical examination. The more frequently such complete histories and physical examinations are made, the more frequently will early cancer be diagnosed and cured.

In taking the history of our patient we should inquire into his vocal habits, his previous laryngeal diseases, his working and living conditions, use of tobacco and alcohol and the presence of cough, earache, and dysphagia.

The examination should include: (1) a thorough laryngeal examination, externally by inspection, palpation and x-ray, and internally by direct and indirect methods; (2) a bronchoscopic and esophagosopic examinations, as lesions discovered by these means may be related to the hoarseness; (3) a careful dental and oral



survey; (4) a check up on the nose, nasopharynx, and nasal sinuses; (5) x-ray of the chest; (6) complete blood tests, both cytologic and serologic; (7) biopsy for completeness.

The specimen for biopsy can best be obtained by using a small biting punch, smaller even than the usual operating laryngeal punch. If the lesion is very small, it is better to remove it entirely, but this occurs very rarely in the larynx.

It seems wise to make biopsy a routine procedure, even though the experienced laryngologist quite often is able to make the diagnosis without it.

No natural barrier can be broken down by taking a biopsy specimen from a laryngeal cancer, as it is not encapsulated. Neither is it necessary to cut through normal tissue in order to obtain it. Experience of numerous observers has clearly shown that taking a specimen for biopsy is not dangerous and does not spread the cancer, either locally or generally. Nevertheless, we know that incomplete operation stimulates the growth, so it is just as well to proceed with the therapy as soon after biopsy as possible. The biopsy can be done at the time of operation if it seems advisable.

The specimen for biopsy may be taken by direct or indirect means, but it must be from the proper site and be of sufficient depth. Repeated biopsies may be necessary as in Case 1, or the biopsy may be positive for cancer and when the cord is removed no cancer is present, as in Case 8. (The biopsy removed the cancer). This is not to be taken as an argument in favor of the intralaryngeal method of removing a cancer from the vocal cord.

Cancer can now be produced experimentally in the laboratory and observations can be made on the changes occurring in the epithelium as it becomes malignant. Just the exact moment when cancer is said to be definitely present, is a matter for the individual pathologist to decide. He bases his opinion upon the extent of epithelial invasion. In other words, it may be difficult for the pathologist to say whether a lesion is precancerous or malignant.

The clinician would do well to realize that cancer is the final end-result of a series of changes and does not suddenly or accidentally appear in previously normal tissue. As Cutler<sup>3</sup> so well puts it: "Before the epithelial cells have actually transgressed normal boundaries they may present all the morphologic appearances of cancer, and biopsy may encounter these epithelial changes during any stage of their progress from benign hyperplasia to malignant neoplasia confined within normal boundaries, and finally to actual invasion of outside tissues. All malignant tumors do not start as malignant tumors and all benign tumors do not stay benign." Right here I must acknowledge my constant use of Cutler and Buschke's book<sup>3</sup> in the preparation of this paper. In my opinion, it is the finest thing in print on the subject.

All pathologists are not agreed that they can determine the degree of malignancy from a biopsy according to Broders classification. In typical cases, very low or very high degree of malignancy, it is generally agreed that there is a relationship between the clinical

and microscopic pictures. The value of the pathological interpretation depends upon the competency of the pathologist, and in any event his interpretation should be related to the clinical findings. Often the location of the lesion is as valuable as the microscopic grading, in determining the degree of malignancy. Another valuable aid is the comparison of the size of the growth to its duration. When the history and clinical course point definitely to cancer, and the biopsy findings are negative, the lesion should be treated as malignant.

Pathologists are also not agreed that they can predict the degree of radiosensitivity from a biopsy. Harris and Klemperer,<sup>4</sup> working on cancer of the larynx, concluded that the biopsy gave no hint as to radiosensitivity. Here again the clinical features are the best guides. The site is important—a false cord tumor is more likely to be radiosensitive than one on the true cord. Papillary tumors are more radiocurable than infiltrating ones. The microscopic information is of value only when used in conjunction with the clinical findings.

### Cancer of the Vestibule

1. Free border of the epiglottis and its laryngeal surface. Early cancer in this location is painless and metastasizes rapidly. It occurs in two main varieties.

a. *Ulcerated*.—Usually, when first seen, this tumor is quite large and there are large lymph nodes present in the neck at the level of the hyoid and beneath the sterno-mastoid muscle. The growth quickly extends through the epiglottis anteriorly, and a mass can be seen and felt between the hyoid and the thyroid cartilages. This may be what brings the patient for examination, and the diagnosis may be missed unless a laryngoscopic examination is made.

b. *Non-ulcerating*.—The smooth mass may act similarly to the ulcerating one, that is, may extend through the epiglottis and produce early adenopathy. In both of these tumors the extension anteriorly can not be told by laryngoscopy, but a good x-ray film will frequently reveal it.

A third type should perhaps be mentioned, since it arises from the tip of the epiglottis. This tumor extends anteriorly to the valleculæ or to the pharyngeal wall and is not a true laryngeal tumor. It responds well to electro-coagulation.

2. *False cord tumor* may be papillary or ulcerating in type. Its most common site is at the junction of the epiglottis and the false cord. Occasionally it starts submucously. Cancer at this site is characterized by early spread to the opposite side, across the base of the epiglottis, as well as through the epiglottis anteriorly. It spreads upward rather than downward due to the lymphatic flow. The ventricular cavity and true cord usually remain free from involvement. Large cervical nodes appear early at the posterior margin of the hyoid bone—similar to those from cancer of the epiglottis. The tumor grows toward the midline and produces early dyspnea. Ulceration and bleeding occur early. Pain in the ear is frequent.

When the growth does impinge on the true cord, hoarseness appears. The voice is lower pitched and the

change is intermittent, which distinguishes it from the continuous hoarseness due to cancer of the true vocal cord.

Vestibular tumors eventually affect both the epiglottis and the ventricular band, regardless of its actual site of origin. They grow rapidly and spread widely and so are usually inoperable when first seen. The treatment of choice is radiotherapy and fortunately the response is good. Even large tumors, with extensive bilateral metastases, do well, as they are made up of radiosensitive cells. In fact, this group makes up most of the successes of radiation therapy in laryngeal cancer.

#### Cancer of the Ventricle

Cancer of the ventricle is characterized in its early stages by invisibility and absence of symptoms. One may find tenderness on palpation of the thyroid cartilage or distortion in its shape when the growth extends externally. Interference with respiration may be the first symptom to appear when the lumen is invaded. Dysphagia occurs if the pyriform fossa is involved.

Mirror laryngoscopy may reveal an elevation of the ventricular band and perhaps the tumor may be seen coming from beneath. Direct examination will discover the tumor earlier than any other diagnostic procedure. It should be mentioned that no direct laryngoscopy is complete without an inspection of the ventricles.

Radiographs may disclose early invasion of the thyroid cartilage as shown by deformity, decalcification or destruction.

Lymphatic spread is upward rather than downward.

If an early diagnosis is made before cartilaginous invasion, radiation offers as good or a better prognosis than surgery, for these tumors tend to be radiosensitive. However, early invasion of the cartilage makes a cure by any therapeutic means very doubtful.

The ventricle is related to certain branchiogenic anomalies, and occasionally cancer develops in these. I have seen two such cases, both diagnosed at operation, and in both recovery took place.

#### Cancer of the Vocal Cord

Cancer of the vocal cord constitutes 90 per cent of laryngeal cancers. The symptoms are local discomfort and persistent hoarseness, which is constant and progressive, unlike the intermittent hoarseness of false cord lesions. The growth of early cancer of the vocal cord is slow and it remains superficial for some time. This is due to the scarcity of lymph vessels, as well as to the fact that they constitute their own network and do not freely anastomose with the neighboring lymphatics. The cord limits extension also, due to its being a fibro-muscular band. The most frequent site is the middle one-third and on the free border of the cord. It extends forward and downward, which makes it favorable for early and complete removal.

Cancer of the vocal cord usually occurs in men over the age of forty, but numerous cases of young people

with this lesion are recorded, so it is either becoming more common or is being recognized earlier.

The differential diagnosis includes chronic laryngitis, benign tumor, keratosis, pachydermia, tuberculosis, lues and paralysis of the vocal cord. A careful study of the general condition of the patient together with observation, perhaps repeatedly, of the local lesion, including biopsy, makes the diagnosis of the early case quite positive.

The local appearance may be: (1) persistent thickening and congestion of the cord; (2) definite tumor, single, grey and warty in appearance, with irregular infiltration; (3) superficial ulceration of limited character; (4) carcinomatous membrane, which spreads along the surface without ulceration or invasion, which tends to extend anteriorly and go around the anterior commissure to the opposite cord; (5) papillary type, usually in a patient who has had benign papillomata previously and represents a malignant degeneration.

Pain is rare in the early stages, for pain is due to ulceration or invasion. Dyspnea is never an early symptom nor is dysphagia.

Fixation of the cord is important in respect to prognosis and diagnosis. Unilateral loss of mobility, when there is a lesion on the cord, is almost pathognomonic of cancer. Lues and tuberculosis may produce fixation, but rarely on one side only. One should consider the possibility of edema or secondary infection as the etiologic factor. In such cases, the motion returns rather early following radiation (Case 5). Fixation was formerly considered an early sign of cancer, but we now know it is a rather late sign, as it is generally due to infiltration of the musculature or to invasion of the arytenoid cartilage.

#### Treatment

In treating a case of early cancer of the vocal cord one must consider surgery or radiation. The surgeon and the radiologist should cooperate for the best interests of the patient. Both should examine the patient and decide together upon the proper treatment. The ideal result would be complete removal or destruction of the tumor without interfering with the vocal or respiratory functions.

*Surgery.*—1. Peroral approach is not recommended, as it is impossible to be sure of complete removal by this technic. However, there are a few isolated examples of a cancer having been successfully removed by means of the laryngoscope.<sup>1, 13</sup>

2. Laryngofissure is the operation of choice. It consists of splitting the thyroid cartilage and removing the diseased vocal cord in one piece with about fifteen millimeters of surrounding tissue. New<sup>10</sup> has found cancer cells may extend up to fifteen millimeters beyond the gross limits of the tumor. At times a portion of the thyroid cartilage is removed. The hyoid bone may be split for better exposure. Tracheotomy may be done. Diathermy applied to the area after excision helps control bleeding and also helps destroy the cancer cells. To prevent subcutaneous emphysema a small, split-rubber tube should be left in the lower part of the

# PROCEEDINGS MINNESOTA ACADEMY OF MEDICINE

## CASES OF EARLY CANCER OF THE LARYNX

Name	Age	Duration of Hoarseness	Location of Lesion	Pain	Fixation of Cord	Date of Operation	Results	
							No Recurrence	Recurrence
1. Koch	52	7 months treated for sinusitis	Right middle $\frac{1}{4}$	Slight dysphagia	1	7-25-29 No x-ray	Died P. M. 5-3-34 following goiter operation	
2. Nerhaugen	55	6 months	Right middle $\frac{1}{4}$	0	0	No x-ray 1-20-31	Seen Oct. 1937 Voice good	
3. Just	72	3 months	Left middle $\frac{1}{4}$ and ventricle	0	1	8-8-35 X-ray postoperatively		1937 X-ray
4. Zwight	69	2 months	Right middle $\frac{1}{4}$	0	1	4-20-36 X-ray postoperatively	Voice good	
5. Berger	32	3 months	Entire right cord and subglottic	Otalgia	2	No operation x-ray 1936	Cords freely mobile Voice perfect	
6. Lordan	75	1 year	Left cord, large mass, tip of right cord	0	2	1-8-37	Died heart failure, 48 hours	Had carcinoma lip operation 20 years ago
7. Krauser	52	4 months	Left cord and tip of right	Otalgia	2	2-5-38 X-ray postoperatively		June, 1938, death
8. Fellows	52	7 months treated sinuses	Middle right cord	0	1	6-22-38 No x-ray	O.K. to date	
9. Knowlton	54	3 months	Left cord and ventricle	0	2	10-2-38 X-ray now		
10. Bruhn	71	2 months	Right cord, middle $\frac{1}{4}$	0	2	10-28-38		

wound, up to the cartilage and beneath the skin, as advised by New.

When cases are properly selected, the operative mortality is very low. Cure is obtained in 85 per cent of the cases. Functional results are good, due to the replacement of the removed cord by a fibrous band. The one cause of disappointment is when this operation is done in borderline cases, such as extension of the cancer to the arytenoid cartilage, the subglottic region, ventricle or false cords.

Fixation of the cord is a contraindication to laryngofissure according to Crowe and Broyles,<sup>1</sup> MacKenty,<sup>2</sup> New,<sup>3</sup> and Hautant,<sup>4</sup> who quotes Gluek, Sorenson and Koehler. Thomson,<sup>5</sup> in 1922, considered fixation a contraindication to laryngofissure, but now has extended the operation to include cases with fixation as well as subglottic involvement. However, his own figures are as follows: unimpaired motility—84 per cent non-recurrence within three years; impaired motility—75 per cent non-recurrence within three years; complete fixation—44 per cent non-recurrence within three years.

If the lesion extends to the anterior commissure or to the opposite side, restricted surgery has less chance of a cure. Jackson<sup>6</sup> reports a method of excising such a lesion, if it is small, by making the incision through the larynx so as to avoid the midline. He reports 79 per cent free from recurrence in thirty-four patients. New also recommends this procedure if the grade is low. Crowe<sup>1</sup> and MacKenty<sup>2</sup> consider the involvement of the anterior commissure a contraindication to laryngofissure. The grade of the tumor, according to Jackson, is not a contraindication to laryngofissure, though New would do a laryngectomy if grade four were found.

Recurrences do not respond well to secondary operation. As MacKenty says, "We have one shot for a bull's-

eye and if we miss, the patient pays with his life." Most authorities agree as to this except Tucker,<sup>7</sup> who states, "Recurrences following thyrotomy may be amenable to another thyrotomy and always to a total laryngectomy."

**Radiotherapy.**—In 1922, before the International Congress of Otology in Paris, Regard, Coutard, and Hautant reported the first successful result of roentgen therapy in laryngeal cancer. Six inoperable patients were treated and all were free from disease at that time. Sixteen years later three were still living (50 per cent). Coutard concentrated his research on the larynx, as it is readily accessible to observation and ray penetration, contains cartilage, joints, and a variety of mucous membranes. Thus, the larynx has contributed much to the knowledge of roentgen therapy in general.

The effects of external radiation, either x-ray or teloradium, are: (1) the devitalization of the tumor cell, and (2), the changes produced in the normal tissue. These latter are: edema, fibrosis, necrosis, alterations in mobility of the vocal cord, lowering of resistance to infection, and are the complications of radiation and limit its effect.

The technic varies with the extension, site and histology of the tumor. A long enough time must be taken to allow the normal tissue to recover, and still deliver a sufficient dose to the diseased tissue.

Radiosensitivity is a clinical term and is confusing in some respects. For example: A tumor may be radiosensitive and respond well to x-ray therapy, but if the tumor recurs it may be radioresistant and not respond well to x-ray therapy. Nevertheless, it is the fact that certain tumor cells are radiosensitive which makes it possible for radiation therapy to affect these cells and still leave the normal structures unharmed.

Radiologists know that the same tumor may vary in

its radiosensitivity at different times. The variation is a decrease rather than an increase in sensitivity. When the blood supply to the tumor is altered by inadequate treatment (either surgery or x-ray) radioresistance develops. This explains why a second course of therapy is less successful than the first. It also means that if the best results are to be obtained, radiation should be used as a preoperative adjunct rather than postoperative. Postoperative radiation probably has little effect on metastases if the operation was complete, for these develop from distant foci already present.

X-ray treatment of the larynx is always accompanied by a skin reaction—not a burn—which usually clears up. The mucous membrane also develops a reaction which should appear at definite times in the different locations of the larynx. These changes are carefully watched by the expert radiologist during his therapy, as they form an excellent guide to the results he is obtaining.

Certain complications of x-ray therapy to the larynx frequently occur, such as pain on swallowing due to pharyngeal irritation; dryness of the mouth due to lack of salivary gland secretion; and edema of the glottis.

Good radiologists are getting better results now than formerly in treating early cancer of the vocal cord. An intense course of radiation therapy is a more formidable procedure than a simple laryngofissure and may be more trying for the patient. At present the results of ray therapy are so unpredictable that the radiologist is unable to assure the patient that the disease can be cured with the same degree of certainty that the surgeon can. Until the results are more consistent, radiation alone should not be depended upon.

If, however, the patient's general condition is such that his life is apt to be short, or if he refuses operation, radiation should be advised. If the tumor shows regression after 50 per cent of the total dose has been given, the treatment should be continued. If not, surgery should be advised, as the tissue will not be damaged enough to interfere with the operation.

The use of radium applied interstitially in early cancer of the larynx has not been successful, according to Cutler, but Negus\* of London recently reports several patients treated by telerradium as well as the interstitial method with excellent results.

Ten case reports in outline are submitted.

#### Subglottic Cancer

Subglottic cancer is probably more frequent than has been realized. The increased use of x-ray as a diagnostic aid in diseases of the larynx will probably result in finding more of these cases. This lesion usually starts about one centimeter below the middle third of the vocal cord. The mucosa here is loosely attached and is covered by cylindrical epithelium. The tumor spreads below the mucous membrane and ulcerates late. When it invades the cord it affects its mobility. If the lesion is seen at this stage, a diagnosis is difficult, and it is hard to know if it started on the cord and extended below, or vice versa. The tumor may cross beneath the anterior commissure or go posteriorly to the cricoid. The cartilages are invaded early.

No clinical signs are present until the cord is affected or until the cartilage is invaded. Hoarseness and pain locally then occur. Lymph nodes may be palpable below the thyroid cartilage.

Taking a specimen for biopsy is difficult, because the tumor is below the mucosa and repeated attempts may not obtain a proper specimen to show the lesion.

This condition is never diagnosed in time to obtain a cure except by total laryngectomy. Radiation treatment is difficult because of early invasion of the cartilage.

#### Conclusions

Early cancer of the larynx varies in its prognosis, diagnosis, and treatment according to its point of origin, as follows:

1. Vestibule—early diagnosis rare, prognosis fair, radiation therapy indicated.
2. Ventricle—early diagnosis rare, prognosis fair, radiation therapy indicated.
3. Vocal cord—early diagnosis should be frequent, prognosis good, surgery indicated.
4. Subglottic—early diagnosis rare, prognosis poor, surgery indicated.

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### CAVERNOUS ATROPHY OF THE OPTIC NERVE

#### Report of Four Cases

HENDRIE W. GRANT, M.D.

Saint Paul

Cavernous atrophy of the optic nerve is a comparatively rare disease causing contraction of the visual fields, loss of vision and cupping of the optic nerve, as in glaucoma, without any definite cause as yet assigned. Most likely to be confused with glaucoma simplex be-



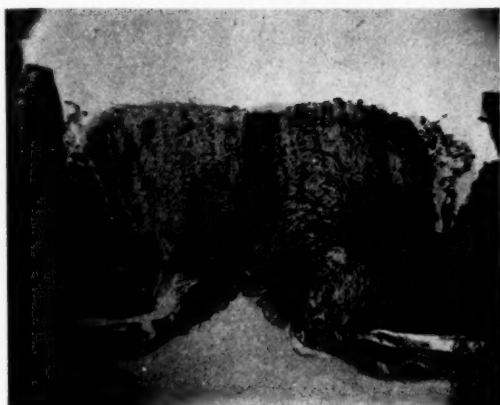


Fig. 1. Cavernous atrophy of the optic nerve in glaucoma. X8.

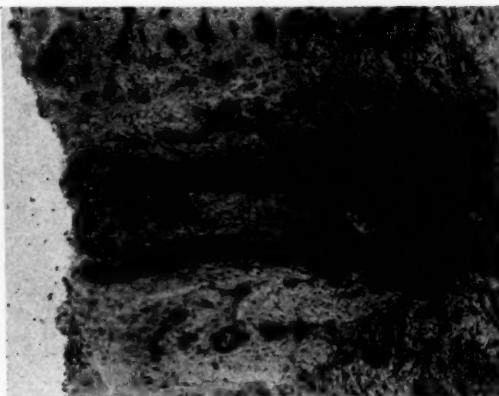


Fig. 2. Area of optic nerve. Note absence of glial tissue. X75 (Fig. 1).



Fig. 3. Calcification of the internal carotid in the cavernous sinus and in the superior orbital fissure (after Knapp).



Fig. 5. Vessels at base of brain. Relation of internal carotid to optic chiasm.



Fig. 4. Internal carotid and ophthalmic artery in cavernous sinus.

cause of the marked cupping of the optic nerve, there are many signs lacking in the former disease.

Increased intraocular pressure is definitely absent and no abnormal rise is seen with the use of mydriatics such as homatropin. Cupping of the optic nerve may extend to the extreme periphery of the nerve, yet in some cases this cupping is not associated with pallor. The loss of vision is extremely slow and not as pro-

nounced as the cupping would indicate. Affecting elderly individuals, only, it is frequently associated with arteriosclerosis but is by no means present in all or even a few individuals who present evidence of arteriosclerosis.

The ordinary measures which are used for the control of glaucoma not only fail to improve vision but may cause a decided reduction through decreased intraocular pressure.

The etiology of this condition is, as yet, unknown although several factors have been described. The anatomical changes in the anterior segment of the eyes, namely, glaucomatous panus, atrophy of the iris, ectopia of the iris pigment and closure of the iris angle are lacking. Recognized by Von Graefe as blindness with excavation of the optic nerve, only a few years later it was classified by Schmidt-Rimpler as glaucoma simplex without increased tension. Later Stock, Fuchs, Markbreiter and Orr reported similar cases, believing that an abnormally weak lamina cribosa caused the excavation without any marked rise in intraocular pressure. Elsching examined histologically one of these cases and found a quite normal anterior segment, a lamina cribosa in normal position and atrophy of the nerve with formations of caverns. Schnabel also

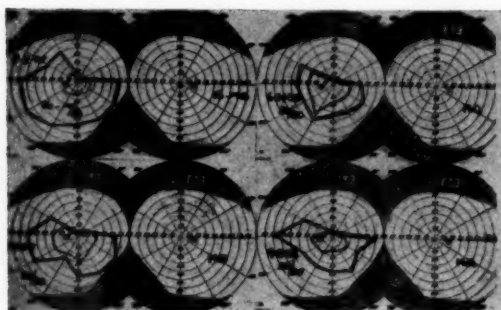


Fig. 6. Peripheral fields in Case 1.

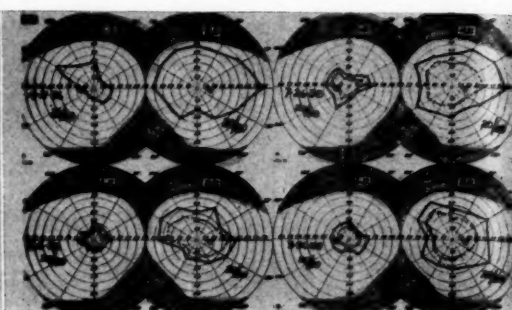


Fig. 7. Peripheral fields in Case 2.

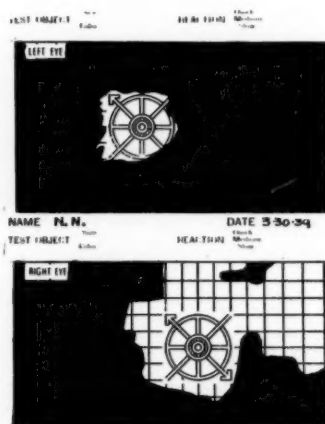


Fig. 8. Central fields in Case 2.

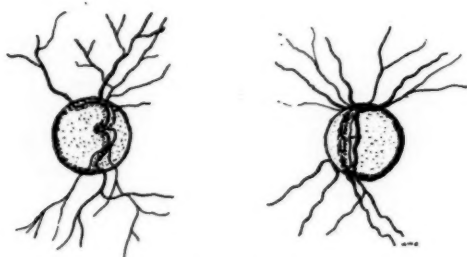


Fig. 9. Cupping of the optic nerve, Case 2.

found these same caverns in glaucoma, while others have reported their presence in high myopia. Unlike simple atrophy, these caverns are not replaced by neuroglia tissue, hence the cupping (Figs. 1 and 2).

Gradle made a review of the cases in 1917 and expressed the belief that the condition was a disease entity not explained by any theory previously given. He stresses the very low grade uveitis and neuritis found by Elsching, the lack of response to decreased intraocular pressure and the failure of all treatment, in support of his contentions. Knapp in 1932 again reviewed the published cases and reported ten cases he had seen in a four year period. He was of the belief that the cupping and atrophy was due to pressure of the sclerosed ophthalmic, carotid and anterior cerebral arteries and showed, roentgenographically, evidence of sclerosis in each of his cases. He also goes into detail concerning visual disturbances associated with arteriosclerosis recognized by Turck since 1852.

Herman Knapp, in 1875, described a case in which a calcareous internal carotid pressed on the lower and outer surface of the optic nerve and produced a nasal field defect (Fig. 3).

Otto in 1893, and Liebrecht in 1907, reported four and

seven cases respectively of sclerosis of the internal carotid and ophthalmic arteries causing optic atrophy. Liebrecht described atrophy as due to pressure from (1) the ophthalmic artery in the fibrous optic canal; (2) the ascending internal carotid; (3) the internal carotid and the anterior cerebral artery as they come in contact with the optic chiasm. Arnold Knapp states, however, that most of the cases are autopsy reports and do not correlate clinical and anatomical findings. The x-ray pictures are extremely difficult to take and are often very disappointing. He also quotes Wilbrand and Saenger and Warburg, who believe that the changes in the optic nerve are due to trophic disturbances from sclerosis of the smaller vessels causing perivascular softening. Sosman, likewise, does not believe that the changes are due to calcification of the vessels (Figs. 4 and 5).

In addition to the four case reports, detailed field studies for central and peripheral fields are shown. Marked improvement in some cases follows therapy with liver extract and Vitamin B. The reason for improvement is not known.

In each case here reported, homatropin has been used on several occasions without any pathologic increase in tension or intraocular pressure. The central field changes and the cupping of the optic nerve are accurate reproductions.

*Case 1.*—H. F., aged seventy-seven, was first seen in 1932 complaining of loss of vision of the right eye which had failed quite rapidly several years ago. He thought that the vision had improved recently. Examination showed vision to be: right 20/20, left M. O.

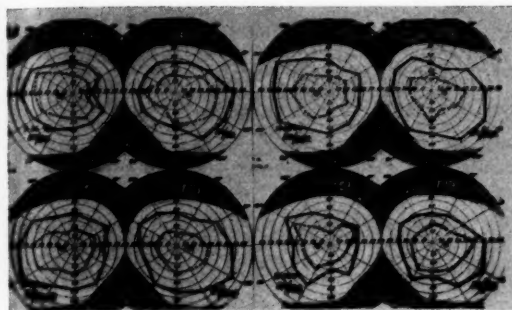


Fig. 10. Peripheral fields, Case 3.

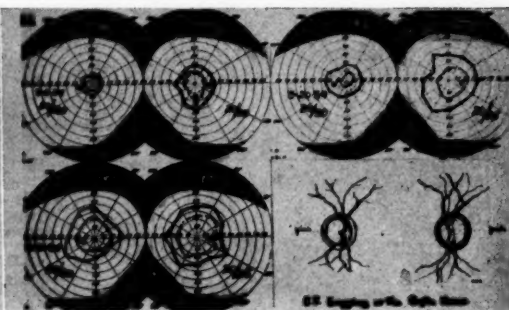


Fig. 13. Peripheral fields and cupping of the optic nerve, Case 4.

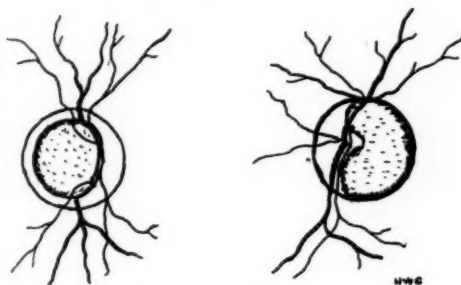


Fig. 11. Cupping of the optic nerve, Case 3.

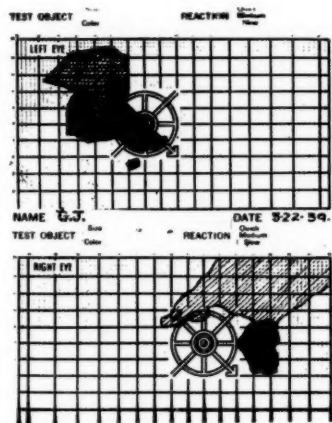


Fig. 12. Central fields, Case 3.

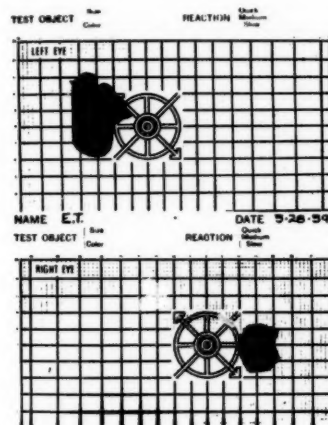


Fig. 14. Central fields, Case 4.

**Case 2.**—Mrs. N. N., aged sixty-six, was first seen in April 1936 complaining of reduced vision and asthenopia. Corrected vision: right 20/20, left 20/15. Tension: right 17 mm., left 17 mm. Each optic nerve shows cupping with considerable atrophy. The left field showed marked contraction while the right eye had peripheral scotomata. General physical examination by Dr. E. M. Jones was negative and x-ray examination failed to disclose any calcareous vascular changes. Improvement following liver therapy has been maintained for several months (Figs. 7, 8 and 9).

**Case 3.**—Miss G. J., aged seventy-six, has been under observation since March 1936 because of failing vision of both eyes, especially for distance. Corrected vision: right 20/30, left 20/40. The fundi showed slight cupping of both optic nerves seen indistinctly because of nuclear sclerosis. Tension: right 17 mm., left 17 mm. There was some increase in the nearsighted correction and nuclear sclerosis which reduced vision to: right 20/40, left 20/50, although no marked increase in cupping or reduction of the peripheral field. During the summer of 1938 she had liver therapy and Vitamin B with some improvement in vision but vision of the left eye was reduced to 20/100. Reduced vision might be accounted for by the nuclear sclerosis but the central field shows a scotoma bordering on central vision and connected to blind spot. The cupping of each optic nerve is shown in the diagram (Figs. 10, 11 and 12).

**Case 4.**—Mrs. E. T., aged seventy-seven, complained of failing vision for the past few years. Corrected

External structures were normal. Tension: right 24 mm., left 20 mm. The fundi showed marked cupping of each optic nerve which, in the right eye, was extreme. There was no marked reduction of pressure with the use of pilocarpine. During the past seven years frequent examinations have shown no change in the tension, a fairly well preserved field and normal vision in the left eye. In June 1938 he was given liver therapy and Vitamin B with marked improvement in the general symptoms and perhaps some improvement in his visual field (Fig. 6).

## TRUTH ABOUT MEDICINE

vision: right 20/30, left 20/100. Tension: right 28 mm., left 28 mm. Fields show marked concentric contraction. Fundi: right, marked cupping without loss of color; left, marked cupping with atrophy. Tension recorded for several days in hospital and never above 28 in spite of complete mydriasis. There was decided improvement after liver extract therapy and Vitamin B. The central vision of the left eye improved from 20/100 and 20/30 (Figs. 13 and 14).

The meeting adjourned.

A. G. SCHULZE, Secretary.

## SULFANILAMIDE AND SMALLPOX

In *The Journal*, May 13, 1939, p. 1936, appears a report of the treatment of four cases of smallpox with sulfanilamide. In three there was only an evanescent macular eruption which rapidly disappeared, and in the remaining case there were only three pustules. Three additional patients were treated only symptomatically and in all three the typical eruption of smallpox developed. However, because of the low case fatality rate of smallpox, conclusions as to the value of sulfanilamide in preventing mortality from this disease cannot be drawn from the four cases thus treated. (J.A.M.A., May 13, 1939, p. 1971.)

## TRUTH ABOUT MEDICINES—NEW AND NON-OFFICIAL REMEDIES

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Non-official Remedies:

**Sulfapyridine.**—[An abstract of the Council's statement on the actions, uses and dosage of sulfapyridine is impossible. The reader is, therefore, referred to the description which appears on page 1831 of *The Journal*, May 6, 1939.]

**Ampoule Solution Sodium Morrhuate 5% with Benzyl Alcohol 2%, 2 c.c.**—Each cubic centimeter contains sodium morrhuate (New and Nonofficial Remedies, 1938, p. 448) 0.05 Gm. ( $\frac{3}{4}$  grain) and benzyl alcohol 0.02 Gm. ( $\frac{1}{2}$  grain) in aqueous solution. The Upjohn Company, Kalamazoo, Mich.

**Solution Sodium Morrhuate 5% with Benzyl Alcohol 2%, 30 c.c. Vials.**—Each cubic centimeter contains sodium morrhuate (New and Nonofficial Remedies, 1938, p. 448) 0.05 Gm. ( $\frac{3}{4}$  grain) and benzyl alcohol 0.02 Gm. ( $\frac{1}{2}$  grain) in aqueous solution. The Upjohn Company, Kalamazoo, Mich.

**Ampoule Solution Sodium Morrhuate 10% with Benzyl Alcohol 2%, 2 c.c.**—Each cubic centimeter contains sodium morrhuate 0.1 Gm. ( $1\frac{1}{2}$  grains) and benzyl alcohol 0.02 Gm. ( $\frac{1}{2}$  grain) in aqueous solution. The Upjohn Company, Kalamazoo, Mich.

**Solution Sodium Morrhuate 10% with Benzyl Alcohol 2%, 30 c.c. Vials.**—Each cubic centimeter contains sodium morrhuate 0.1 Gm. ( $1\frac{1}{2}$  grains) and benzyl alcohol 0.02 Gm. ( $\frac{1}{2}$  grain) in aqueous solution. The Upjohn Company, Kalamazoo, Mich.

**Rabies Vaccine-Human (Phenol-Killed).**—Antirabic vaccine (New and Nonofficial Remedies, 1938, p. 402) prepared according to the general method of Sir David Semple. Sterility, toxicity and safety tests are made. It is marketed in packages of seven 0.5 c.c. ampule-vials (without syringe) and in fourteen 0.5 c.c. ampule-vials (with syringe). National Drug Company, Philadelphia. (J.A.M.A., May 6, 1939, p. 1831.)

**Racephedrine Hydrochloride-Gane's Chemical Works, Inc.**—A brand of racephedrine hydrochloride-N.N.R. (J.A.M.A., April 1, 1939, p. 1257). Gane's Chemical Works, Inc., New York. (J.A.M.A., May 13, 1939, p. 1951.)

**Concentrated Antipneumococcic Serum, Types IV and VIII-Squibb.**—An antipneumococcus serum types IV and VIII combined (J.A.M.A., June 18, 1938, p. 2082) prepared by immunizing horses with intravenous injections of cultures of types IV and VIII pneumococci. The serum is refined and concentrated by the method of Lloyd D. Felton. The usual sterility and safety tests are made, as required by the regulations of the U. S. Public Health Service. It is marketed in vials containing 20,000 and 50,000 units respectively of each type. E. R. Squibb & Sons, New York.

**Concentrated Antipneumococcic Serum, Types V and VII-Squibb.**—An antipneumococcus serum types V and VII combined (J.A.M.A., June 18, 1938) prepared by immunizing horses with intravenous injections of cultures of types V and VII pneumococci. The horses are bled aseptically and the serum is refined and concentrated by the method of Lloyd D. Felton. The usual sterility and safety tests are made, as required by the regulations of the U. S. Public Health Service. The product is marketed in packages of one vial containing 20,000 units and 50,000 units respectively each of types V and VII. E. R. Squibb & Sons, New York.

**Barbital Sodium Tablets, 5 Grains.**—Each tablet contains barbital sodium—Abbott (New and Nonofficial Remedies, 1938, p. 129) 5 grains. Abbott Laboratories, North Chicago, Ill.

**Suprarenalin Solution 1:1,000 in 1 c.c. Ampules (For Hypodermic Use).** Armour Laboratories, Chicago, Illinois.

**Suprarenalin Solution 1:1,000 in 10 c.c. Vials (For Hypodermic Use).** Armour Laboratories, Chicago, Illinois.

**Suprarenalin Solution 1:1,000 in 1 oz. Bottles (For Parenteral Use).** Armour Laboratories, Chicago, Illinois.

**Suprarenalin Solution 1:10,000 in 1 c.c. Ampules (For Hypodermic Use).** Armour Laboratories, Chicago, Illinois. (J.A.M.A., May 27, 1939, p. 2137.)



# TRANSACTIONS of the MINNEAPOLIS SURGICAL SOCIETY

Stated Meeting, April 6, 1939

Vice President, DR. THOMAS KINSELLA, in the Chair

## TRAUMATIC RUPTURE OF THE NORMAL SPLEEN WITH DELAYED HEMOR- RHAGE

### Case Report

R. C. WEBB, M.D.

A school boy, aged eight years nine months, was admitted to the Asbury Hospital in Minneapolis on Friday, February 24, 1939, one week after injury.

Complaints: Pain in the upper left abdominal quadrant, weakness, vomiting, fever and anemia.

Present Illness: On Friday, February 17, 1939, at 4:30 p. m., while watching a high school hockey game he was struck in the upper left quadrant of the abdomen by a hockey puck. He was dressed for the outdoors and wore a corduroy jacket. He immediately complained of pain, doubled up and became weak but did not fall, and he acted as though his wind were knocked out of him. He walked about thirty feet, bent over toward the affected side, and he then asked to be carried. He vomited about thirty minutes after injury. He was very restless Friday night and complained of his stomach feeling hard. Saturday afternoon he was up and about and walked seven blocks. On Sunday he was considerably improved, ate his breakfast and went to Sunday School, but he still had pain in his upper left abdomen, and he walked slightly stooped over. On Monday and Tuesday he went to school. On Monday his hemoglobin was taken and was found to be 74 per cent. On Tuesday afternoon at 4 o'clock while getting his clothes on to leave school he had an attack of severe pain in the upper left abdomen, and he became weak and vomited and was carried home.

He was placed in bed and alternately hot and cold packs were placed on the abdomen. On Wednesday he became weaker and the treatment was continued throughout Wednesday and Thursday. Thursday evening he had a temperature of 101 F., and his hemoglobin was found to be 40 per cent. A rupture of the spleen was diagnosed. He was placed in an automobile and was brought 160 miles to Minneapolis.

Past history was unimportant.

Physical examination revealed a temperature of 101.8 degrees, pulse 124, respirations were normal. Lips were pale and swollen. The left upper abdominal quadrant was tender and slightly rigid. The abdomen was slightly distended. There was increased dullness in the splenic area and shifting dullness in the flanks. Blood pressure was 106/74. Physical examination was otherwise normal.

Blood examination on admission was as follows: hemoglobin, 52 per cent; red blood cells, 2,900,000; white blood cells, 11,200; polymorphonuclears, 61 per cent.

X-ray examination was made of the chest and abdomen. The left diaphragm shadow was elevated. The ribs were normal. There was increased density in the upper left quadrant with slight displacement of the stomach toward the right side.

Patient was placed at rest in bed and the pulse rate dropped to 120 per minute. The blood examination was repeated after six hours and the hemoglobin was 42 per cent, the R. B. C. was 2,600,000. He was given a transfusion of 300 c.c. of citrated blood and was operated upon on Friday, February 24, 1939. An

upper left rectus incision was made and on opening the peritoneum dark blood gushed from the incision and the abdomen was distended with dark blood with numerous clots in the upper left quadrant. The spleen was found to be about twice normal size, and there were two subcapsular hematomas on the lateral surface and a laceration at the junction of the upper and middle thirds of the spleen. The spleen was removed and the wound was closed without drainage, using fine silk. No effort was made to remove the blood from the abdomen. A transfusion of 300 c.c. citrated blood was given immediately after the operation.

Convalescence was uneventful. Temperature reached normal the third day after operation, and the pulse became normal on the sixth day after operation. The hemoglobin steadily improved and registered 72 per cent when the patient was discharged from the hospital on the twelfth day after operation.

### Discussion

DR. MARTIN NORDLAND: Dr. Webb's case report was both interesting and instructive. He did not discuss the technic of splenectomy and I would like to make a few remarks on this point.

The spleen makes up about one per cent of the total body weight and is known to be a very vascular structure. In the excision of the spleen, because of its great vascularity, one should attempt to preserve as much of the blood that is in the organ as possible for the patient. Therefore, the vessels of the pedicle should be ligated separately, clamping the artery first and waiting a sufficient time for the organ to empty as much of its blood through the vein as possible before the ligature is applied to it.

DR. A. A. ZIEROLD: Everyone, from time to time, sees ruptures of the spleen with immediate hemorrhage which, while not common, certainly are not rare, but delayed rupture, the subcapsular injuries of the spleen, certainly are much rarer than the ordinary type. I judge from Dr. Webb's remarks, that he had in mind only subcapsular rupture with delayed hemorrhage. Most of the foreign literature reports these cases as two-stage hemorrhages or two-stage ruptures, and in many of the articles concerning rupture of the spleen no distinction is made between delayed and immediate hemorrhage.

Lawrenz reported some 235 cases of rupture of the spleen in 1900 and probably about that time ruptures of the spleen attained their greatest attention because it was only a short time before that the first operation for rupture of the spleen had been performed. In his list of cases he makes no distinction between immediate hemorrhage and delayed hemorrhage, and while I do not recall all of the cases reported, there were several that had developed symptoms from seven to ten or eleven days, which, as Dr. Webb states, is the usual interval.

In 1938 at the General Hospital there were three cases of delayed hemorrhage that perhaps might fall within this group. These occurred the second, third and fourth day following injury; technically delayed hemorrhage, perhaps subcapsular, but probably not the classical picture of the subcapsular injury of the spleen.

My personal experience is limited to one case. I had seen an old man who had sustained a bruise on his

left side from which he had apparently recovered and I was examining him to see the result of his injury and the extent of disability. I saw him a week after injury, at which time he was somewhat sore but presenting no other symptoms than just slight muscular tenderness in the left flank. I considered him as convalescent and ready to be up and about and dismissed the matter from my mind. I was told that the second week following his injury he had gotten up, walked to the grocery store, collapsed and died from a subcapsular rupture and delayed hemorrhage of the spleen.

The picture seems to be fairly definite. The symptomatology, as Dr. Webb has detailed it, seems to be rather uniform in all of the reports but I think it is most desirable that subjects such as this be brought to our attention. It would seem advisable in all suspected cases that the period of observation be extended, long past what we would ordinarily consider sufficient for a bruise of the muscle of the back or the side.

## PROTRUDED INTERVERTEBRAL DISC

### Case Report

H. M. LEE, M.D.

*Case 1.*—N. A., a white male, aged twenty-eight, was first examined October 5, 1938.

*Complaints:* Pain in lower back with radiation into right thigh and leg. Weakness and atrophy of right thigh.

*History of Present Condition:* About the middle of October, 1937, he had cranked a car for about fifteen minutes. There was no immediate pain in the back. A few days later he noted pain in the lower back, radiating along the lateral surface of the right thigh. The pain became progressively more severe and he was then disabled for two weeks. He was seen by a physician, who made a diagnosis of sciatic neuritis. He had several injections of sodium salicylate and sodium iodide with no relief. His symptoms finally abated to some degree so that he was able to resume his occupation but continued to have at least intermittent pain in the lower back radiating into the right thigh, the pain at times being almost unbearable. By July, 1938, he noticed atrophy in the muscles of the right thigh. During the summer of 1938 he received a series of chiropractic treatments with no relief.

*Examination:* Height, 6 feet; weight, 130 pounds. General physical examination negative except for definite atrophy of the right thigh with marked weakness in entire extremity and absence of knee jerk on the right side. Other reflexes were normal. There was no scoliosis. X-rays of lumbar spine and pelvis were negative. Urinalysis negative.

On October 10, 1938, he was admitted to Asbury hospital for spinal fluid examination. Manometric readings were within normal limits. Spinal fluid was clear. 11 lymphocytes; globulin present; total protein 65 mgms. Spinal fluid Wassermann and Kline both negative. Nonne negative.

On November 7, 1938, 4 c.c. of lipiodol were injected into the subarachnoid space through the third lumbar intervertebral interspace. Fluoroscopic and x-ray examinations revealed an obstruction at the second lumbar intervertebral space.

*Operation.*—On January 26, 1939, under gas-ether anesthesia, a bilateral laminectomy was performed involving the first and second lumbar vertebrae. When these laminae had been removed, a very dense ligamentum flavum was noted and at the right side of this ligament there was an indefinite mass, apparently

attached to the ligament. This mass with the ligament was resected. The cord was rotated to expose the spinal nerve roots at this level. These were apparently normal. No protrusion or obstruction was noted anterior to the cord. The dura was opened and the lipiodol sucked out. Some of the fibers of the cauda appeared somewhat injected but otherwise normal. The dura was closed with fine silk. The patient made an uneventful recovery and he was discharged from the hospital on February 7, 1939. He resumed his occupation on April 3, 1939, and has been free from pain, and he states that his right leg is getting stronger.

This man was disabled for a period of nine weeks following his laminectomy.

*Pathologist's report on tissue removed.*—"Section shows tissue to be a piece of fibrocartilage."

*Case 2.*—A. B., a white male, aged 40, 5 feet 9 inches in height and weighing 150 pounds.

This man, a truck driver, first came under my care on January 27, 1938. His complaints at that time were pain in the lower back with radiation into the left thigh, leg and foot.

*History of Present Condition.*—On June 2, 1937, while removing a tire from his truck he felt a sudden pain in the lower back, in the lumbo-sacral region. Five days later the pain radiated down the left leg. He continued to work until October 16, 1937, in spite of his discomfort, but was then unable to continue. He consulted chiropractors and medical men in his home town in Montana. He obtained no relief and continued to be disabled.

*Past History:* Entirely negative.

*Family History:* Negative.

*Physical Examination:* The general physical examination was entirely negative except for bilateral inguinal herniae and obvious evidence of trouble in the lower back. There was a marked inclination of the trunk to the right with definite rigidity of the erector-spini muscles. The left thigh could be flexed through an angle of 60 degrees while the right could be flexed through an angle of 90 degrees. He localized his pain in the region of the left sacro-iliac joint on to buttock and along the course of the left sciatic nerve. There was some atrophy of the muscles in the left thigh and calf. Reflexes were all normal. The blood Wassermann was negative. X-rays of lumbar spine and pelvis revealed no evidence of fracture or dislocation. There was noted, however, a scoliosis with rotation of lumbar spine toward the left with a resulting tilting of pelvis. There were also arthritic changes in the fourth and fifth lumbar vertebrae. The patient was hospitalized and conservative treatment instituted consisting of rest in bed, large doses of salicylates, and finally stretching of the left sciatic nerve with only slight relief. He was discharged from the hospital for a period but was re-admitted on March 13, 1938, at which time a fasciotomy was done over the left thigh. This appeared to give some relief. He was discharged from the hospital and returned to his home in Montana. However, he continued to be disabled and sought further medical and other treatment in his home community.

On February 3, 1939, he again came under our care. His complaints were exactly as they had been at the time of our previous examination in January, 1938. The physical findings were essentially the same. Reflexes were all normal except for absence of the cremasteric reflex on both sides. This, I believe, can be accounted for by the fact that a bilateral herniotomy had been performed and all cremasteric fibers removed. Complete x-ray films were again made of the lumbar spine and pelvis. Findings were identical with those previously reported.

On February 7, 1939, a spinal puncture was made through the fourth interspace. The manometer registered 110 millimeters. Oscillations were low. Jugular compression increased the pressure to 220. On release of the jugular compression the spinal fluid pressure dropped rather promptly to 120. The spinal fluid was clear. The spinal fluid Wassermann was negative. Total protein was 30 mgms.

On February 13, 1939, 5 c.c. of lipiodol were injected in the second interspace. Subsequent fluoroscopic and x-ray examination revealed evidence of obstruction between the fourth and fifth lumbar vertebrae and a suggestion of a similar defect but to a lesser degree between the second and third lumbar vertebrae.

**Operation.**—On February 23, 1939, under general anesthesia, a laminectomy was performed involving the third, fourth, and fifth lumbar vertebrae. The ligamentum flavum between the fourth and fifth was greatly thickened. This was resected. The cord was rotated, exposing the third and fourth dorsal roots, the fourth root on left side appearing somewhat edematous. As the cord was rotated there was noted a bulging of the fourth intervertebral disc. The posterior longitudinal ligament was incised and the disc tissue escaped. The dura was opened and the lipiodol sucked out. There was no intradural pathology noted except perhaps slight edema of the fourth left root. The dura was closed with fine silk. The patient made an uneventful recovery and was discharged from the hospital on March 17, 1939, returning to his home in Montana on that date.

This patient was allowed out of bed on the twelfth postoperative day. His sciatic pain had completely disappeared and the scoliosis was absent. I received a letter from this patient dated March 30, 1939, in which he states that his pain is gone and that he can now really straighten up, referring to his back.

I anticipate that this man will be able to resume some occupation in ten or twelve weeks from date of his operation.

**Pathologist's Report.**—"Section shows piece of fibrous tissue (ligamentum flavum). Another section shows a mass of fibrocartilage" (intervertebral disc).

### Discussion

DR. EDWARD T. EVANS (by invitation): I don't think the answer to low back complaints is as yet written. I think we are going to find out more and more about these cases and are going to gradually evolve some judgment with reference to the treatment thereof. This without criticism one way or the other, except I think that conservative treatment should always be carried out in every back complaint and operative procedure reserved as a last resort.

I had the occasion last week to have the privilege of reading a paper which will be presented in Surgery magazine, by Dr. Horowitz of, I believe, Philadelphia, of seventy-five consecutive autopsies with special reference to the spine. I think it would behoove all of you to read it. It has some very interesting data on the frequency with which discs, hypertrophies of capsules, periarticular capsules, and so on, occur in spines which give no history of complaints during life. Those reports will give us something upon which to base our judgment. I think there is no question whatsoever but that laminectomy for the prolapsed intervertebral disc gives result. The question in my mind is—are we operating upon a symptom and is it the decompressing laminectomy, after all, which gives the result.

## OBSERVATIONS ON THE TREATMENT OF INTRACAPSULAR FRACTURES OF THE NECK OF THE FEMUR

EARL C. HENRIKSON, M.D.

### Inaugural Thesis—Summary

Dr. Henrikson studied a series of 102 cases of intracapsular fracture of the hip admitted to the Minneapolis General Hospital in the four years from 1935 to 1939. His study brought out the following points:

There were twenty-four patients treated in *Whitman casts*. Their average age was fifty-nine. Of eleven impacted fractures so treated, all united. Of thirteen non-impacted fractures only 46 per cent united. None of the twenty-four died.

There were fifty-eight patients treated by *internal fixation*. Their average age was sixty-six. Four were impacted. One of these died. In the three survivors the fracture united. Fifty-four were non-impacted fractures. Ten died and thirty-four of the forty-four survivors, or 77 per cent, united.

There were thirteen patients treated by *bed rest* alone, seven by *traction*, and 3 in *walking spicas*. Their average age was seventy. Eleven were impacted, of whom one died. In all ten survivors the fracture united. Only 20 per cent of the five surviving non-impacted fractures united.

Eliminating the impacted fractures (100 per cent of the survivors having united) by far the best results were obtained in those treated by internal fixation (77 per cent union).

A study of the mortality shows that there has been a drop from 50 per cent, in the period from 1920 to 1930, to 10 per cent in 1938. From 1920 to 1930, most were treated by the Whitman method. Of thirty-three admitted in 1938 all but three were treated by internal fixation regardless of condition. Thirty-four operations were performed with but two deaths—one from an embolism on the fifth postoperative day and one from broncho-pneumonia on the ninth postoperative day. Immediate operation in practically all cases was recommended to offset development of complications which would be contraindications to surgery.

Infection developed in five of sixty-four operations. Three operations followed by infection took less than an hour, two less than two hours. Prolonged operations were not more prone to sepsis. All five fractures were of over two weeks standing, three over a month. Only one was done under local anesthesia. Three had the so-called "open" operation in which the fracture site is exposed to view. There had been no infections in the past eight months in about twenty-five cases since crystalline sulfanilamide had been implanted in the wound.

There were sixteen patients who developed non-union due to slipping of the nail or fragments or due to necrosis of the head or neck. The fracture slipped out of position in fourteen patients within three or four months of the operation. Five were renailed, of whom four united and one failed to unite due to

## BOOK REVIEWS

metastasis from a carcinoma of the prostate. Three died. Two had McMurray osteotomies—one with a fair and one with a poor result. One patient developed a sterile necrosis of the head, another head necrosed due to infection. Deducting the four cases uniting after renailing there were twelve non-unions—20 per cent. There were twelve subcapitals, two central and two oblique fractures. The average time to slipping was ninety days. The reduction and nailing was favorable in seven and unfavorable in six. A spica cast may have prevented slipping in eleven of fourteen. His study revealed that where there was accurate reduction and perfect nailing, 85 per cent obtained bony union, whereas, when the reduction was poor and the nailing inaccurate, 85 per cent resulted in non-union.

Dr. Henrikson came to the conclusion from a study of this series that the percentage of unions in non-impacted fractures of the neck of the femur might be materially increased (1) by more perfect reduction

and nailing, which can be accomplished in most cases if the Leadbetter technic for reduction is used, and if the forefinger is used to palpate the anterior and inferior surface of the neck of the femur to orient the surgeon before inserting the guide wires and nails; (2) by applying external fixation in the form of short light spica casts to all cases internally fixed in order to more adequately prevent motion at the fracture site.

He stressed the importance of an x-ray immediately in all old persons who fall and complain of pain in the hip, thigh, or knee. The patient's knees should be banded together to prevent abduction and external rotation and consequent disimpaction. When impaction is maintained, 100 per cent unite when placed in a plaster spica and the mortality is practically nil.

The meeting adjourned.

HARVEY NELSON, *Secretary.*

## BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

### BOOKS RECEIVED FOR REVIEW

**DISEASES OF THE NOSE AND THROAT.** Second Edition. Charles J. Imperatori, M.D., F.A.C.S., Professor of Otolaryngology, New York Polyclinic Medical School and Hospital, etc., etc., and Herman J. Burman, M.D., F.A.C.S., Adjunct Professor of Otolaryngology, New York Polyclinic Medical School and Hospital, etc., etc. 726 pages. Illus. Price, \$7.00, cloth. Philadelphia: J. B. Lippincott Co., 1939.

**PERSONAL AND COMMUNITY HEALTH.** Fifth Edition. C. E. Turner, A.M., Sc.D., Dr.P.H., Professor of Biology and Public Health, Massachusetts Institute of Technology; formerly Associate Professor of Hygiene, Tufts College Medical and Dental Schools, etc. 652 pages. Illus. Price, \$3.00, cloth. St. Louis: C. V. Mosby Co., 1939.

**SYPHILIS AND ITS ACCOMPLICES IN MISCHIEF: SOCIETY, THE STATE AND THE PHYSICIAN.** George M. Katsinos, M.D. 676 pages. Price, \$5.00, paper cover. Privately printed by the Kyklos Publishing Co., Athens, Greece, 1939.

**LIFE AND LETTERS OF DR. WILLIAM BEAUMONT.** Jesse S. Myer, A.B., M.D. Late Associate in Medicine in Washington University, St. Louis. Introduction by Sir William Osler, B.T., M.D., F.R.S., late Regius Professor of Medicine in Oxford University, England. 327 pages. Illus. Price, \$5.00, cloth-backed stiff cover. St. Louis: C. V. Mosby Co., 1939.

**WHAT IT MEANS TO BE A DOCTOR.** Dwight Anderson. 96 pages. Cloth, \$1.00, paper, 25c. New York: Public Relations Bureau, Medical Society of the State of New York, 2 East 103rd St., 1939.

**THE PATIENT AS A PERSON.** A Study of the Social Aspects of Illness. G. Canby Robinson, M.D., LL.D., Sc.D. Lecturer in Medicine Johns Hopkins University. 423 pages. Price, \$3.00, cloth.

New York: The Commonwealth Fund, 41 East 57th St., 1939.

**CANCER OF THE BREAST AND CANCER OF THE UTERUS.** Second Edition. Marion Ellsworth Anderson, A.B., M.D. 106 pages. Illus. Price, \$1.00, paper. Franklin Press, Clinton, Iowa.

**CANCER HANDBOOK OF THE TUMOR CLINIC OF Stanford University School of Medicine.** Editor Eric Liljencrantz, M.D. Chief of Tumor Clinic, Stanford University School of Medicine; Consultant in Neoplastic Diseases, U. S. Naval Hospital, Mare Island, and U. S. Marine Hospital, San Francisco. 114 pages. Illus. Price, \$3.00, cloth. Stanford University Press, Stanford University, Calif., 1939.

**CLINICAL PATHOLOGICAL GYNECOLOGY.** J. Thornwell Witherspoon, B.S., B.A., M.A., M.D. Formerly Associate Professor Experimental and Pathological Gynecology, Indiana University Medical Center, Indianapolis. 400 pages. Illus. Price, \$6.50, cloth. Philadelphia: Lea & Febiger, 1939.

**PRACTICE OF ALLERGY.** Warren T. Vaughan, M.D., of Richmond, Va. 1082 pages. Illus. Price, \$11.50, cloth. St. Louis: C. V. Mosby Co., 1939.

**A TEXTBOOK OF OBSTETRICS.** With Special Reference to Nursing Care. Charles B. Reed, M.D., F.A.C.S. Associate Professor of Obstetrics, Northwestern University Medical School; Head of Obstetrical Department, Wesley Memorial Hospital, Chicago. 476 pages. Illus. Price, \$3.00, cloth. St. Louis: C. V. Mosby Co., 1939.

**VARICOSE VEINS.** Alton Ochsner, B.A., M.D., D.Sc. (Hon.), F.A.C.S. William Henderson Professor of Surgery and Director of Department of Surgery, School of Medicine, Tulane University of Louisiana. 147 pages. Illus. Price, \$3.00, cloth. St. Louis: C. V. Mosby Co., 1939.

**SOCIOLOGY AND SOCIAL PROBLEMS.** A Textbook for Nurses. Deborah MacLurg Jensen, R.N., B.Sc. Social Service Consultant to the Visiting Nurse Association, St. Louis; Lecturer in Nursing Education, Washington University; formerly Assistant Director, School of Nursing, Washington University. 341 pages. Price, \$2.75, cloth. St. Louis: C. V. Mosby Co., 1939.



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**PRINCIPLES OF HEMATOLOGY.** Russell L. Haden. Philadelphia: Lea & Febiger, 1939.

In this manual, Dr. Haden has set out "to simplify the study of the disorders of the blood for the student and physician."

He has succeeded in this endeavor. With the aid of ingenious diagrams, he presents the current present knowledge and theory of the normal and abnormal morphology and physiology of the blood in a concise and orderly fashion. Doctor Haden adheres to the polyphyletic teaching of Sabin and Doan, in connection with the origin of the blood cells, but the monophyletic views of Downey are given adequate space.

Following this section there is an excellent summary of the essential laboratory methods in hematology. The blood diseases themselves are described, and their treatment discussed in conjunction with one hundred case histories which are a novel and valuable feature.

One might venture to disagree with Doctor Haden, that the macrocytic anemia of hepatic cirrhosis "is due to a deficient supply to the bone marrow of the erythrocyte maturing factor." This anemia is in most instances hemolytic, and is benefited very little by liver extract. A regrettable omission is the lack of a reference to Watson's methods for determination of urobilinogen in feces and urine, which have proved so valuable in the analysis of obscure anemias, particularly of the hemolytic type.

In general, however, Doctor Haden's book can be highly recommended to those seeking a simple exposition of modern hematology.

J. J. BOEHRER, M.D.

**SURGICAL TREATMENT OF HAND AND FOREARM INFECTIONS.** A. C. J. Bruckel, A.B., M.D. 300 pages. 166 text illustrations; 35 black and white illustrations; 10 color plates. St. Louis: C. V. Mosby Company, 1939.

The anatomic aspects of the hand and forearm have been dealt with very carefully, and the radiopaque injections of the hand spaces have been presented with meticulous care. The author states that the mid-palmar and thenar spaces are those commonly involved. This statement does not coincide with the description of other authors. The descriptive matter of the terminal closed spaces and the many illustrations (including ten in color) have been carefully presented, with practical clinical notes at the end of each subject.

This book has brought to a definite focus all the clinical manifestations, as well as the technic in treating acute infections of the hand and forearm, in a clear and concise fashion and completely covers the subject.

PAUL H. KELLY, M.D.

**CLINICAL PATHOLOGICAL GYNECOLOGY.** J. T. Witherspoon, M.D. 400 pages. Illus. \$6.50. Philadelphia: Lea & Febiger, 1939.

The author states in the preface that the motive for writing this book was prompted by the experience which he gained when he conducted a course on Clinical Pathological Gynecology, and that his motive was to present to the reader both the pathological and the

clinical pictures of these disease conditions. There are many pathological conditions which could justifiably be included under this general heading but the author purposely omitted them feeling that they were presented better in other well known books.

This book is of three hundred and seventy-five pages and has two hundred and seventy-one very excellent engravings. The subject-matter is taken up in a very systematic manner, and at the end of each chapter or section the various references are listed. In every paragraph throughout the whole book the important word, phrase, or clause is brought to the reader's attention by being in heavy type. The text throughout is brief and to the point.

ALBERT G. SCHULZE, M.D.

**THE VAGINAL DIAPHRAGM: ITS FITTING AND USE IN CONTRACEPTIVE TECHNIQUE.**

Le Mon Clark, M.S., M.D. 106 pages. Illustrated. Cloth, \$2.00. St. Louis: The C. V. Mosby Co., 1939.

This book is an excellent, concise monograph concerning the technique of fitting and instructing a patient with the vaginal diaphragm which, when used with a spermicidal jelly, is generally accepted as the most effective contraceptive method now available. With the acceptance of the fact that a knowledge of, and the ability to instruct and fit a patient with a reliable contraceptive method should be a part of most physicians' armamentarium, Dr. Clark clearly discusses all phases of the vaginal diaphragm method—illustrations clarify his comments. This book could well be used as a textbook for medical students, physicians in general practice, and as a reference book for birth control clinics and gynecologists.

E. C. BAGLEY, M.D.

**MEDICINE IN MODERN SOCIETY.** By David Riesman, M.D., Professor History of Medicine, Princeton University. 215 pp. Price \$2.50. Princeton University Press, 1938.

This volume consists of some fifteen chapters, the first, largely historical, dealing with the developments of modern scientific medicine. There follows a discussion of medical progress, in which the author takes up various discoveries which he selects as the peaks or high spots in the development of scientific medicine. These discoveries are totally unrelated and vary from the discovery of the hypodermic needle, the transmission of disease by insects, antitoxins, x-ray, et cetera. The material is most interesting, and, written as it is, in a popular style, with the personal touch of a really astute clinician, it should have a wide appeal. Such subjects as cancer, from the historical standpoint, psycho-analysis, middle-age medicine, leisure and health, are entertainingly presented. The chapter devoted to medical ethics is particularly interesting and well presented. At the end the author indulges in a chapter on social medicine in which he seems to lose contact with reality, and, like so many of our present-day writers, seems to indulge in a great deal of wishful thinking without an accurate grasp of the realities and

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the practical difficulties in the way of idealistic programs. On the whole, however, the book is well worth reading.

C. B. W.

**PRACTICE OF MEDICINE.** Second edition. Jonathan Campbell Meakins, M.D., LL.D., Professor of Medicine, McGill University, et cetera. 1413 pages. Illus. Price, \$12.50. St. Louis: C. V. Mosby Co., 1938.

The second edition of the *Practice of Medicine* is an improvement over the first. This improvement is a natural one and is the result of the discovery of newer methods of therapeutics. As in the first edition, Doctor Meakins has put forward a valuable "instrument" in the hands of the medical profession. This "instrument" is of value to the general practitioner and internist. He still discusses the various diseases and the derangements of the body in a very clear-cut manner and carries throughout a common sense philosophy which will stimulate the reader to do some solid thinking himself. The illustrations throughout the book are valuable and there is no doubt that they make it more practicable.

Although the author pays very little attention to anatomical changes in dealing with any of the diseases, he has arranged the chapters of the book in an anatomical order. This, I think, makes the entire work more life-

like and interesting. It helps to correlate the disease processes in various parts of the body and aids the reader in thinking of the human being as a complete individual.

It is difficult to select any particular chapter as being of more value or educational than another. However, I think that Chapter V., which deals with diseases of the lung is a very good example of the general trend of thought that is carried throughout the *Practice of Medicine*. The author spends considerable time in discussing the nature and cause of symptoms. As an example of this, I would suggest that all doctors, regardless of their specialty, read the discussion of cyanosis. This will demonstrate to the reader the value of a practical knowledge of physiology and physiological chemistry in diagnosis and treatment. The discussion of symptoms shows a keen analysis and recognition of the altered physiology of the sick.

The author expresses general ideas in the introductory chapter. This chapter should be read by all. Doctor Meakins generalizes on the doctor and the patient. He paints a picture of the doctor as he really should be and probably is. He tells how the doctor should evaluate the stories given by the patient and from these, to arrive at a diagnosis which is as nearly correct as possible.

I think that the entire book is a valuable contribution to the medical profession.—JOSEPH M. RYAN, M.D.

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